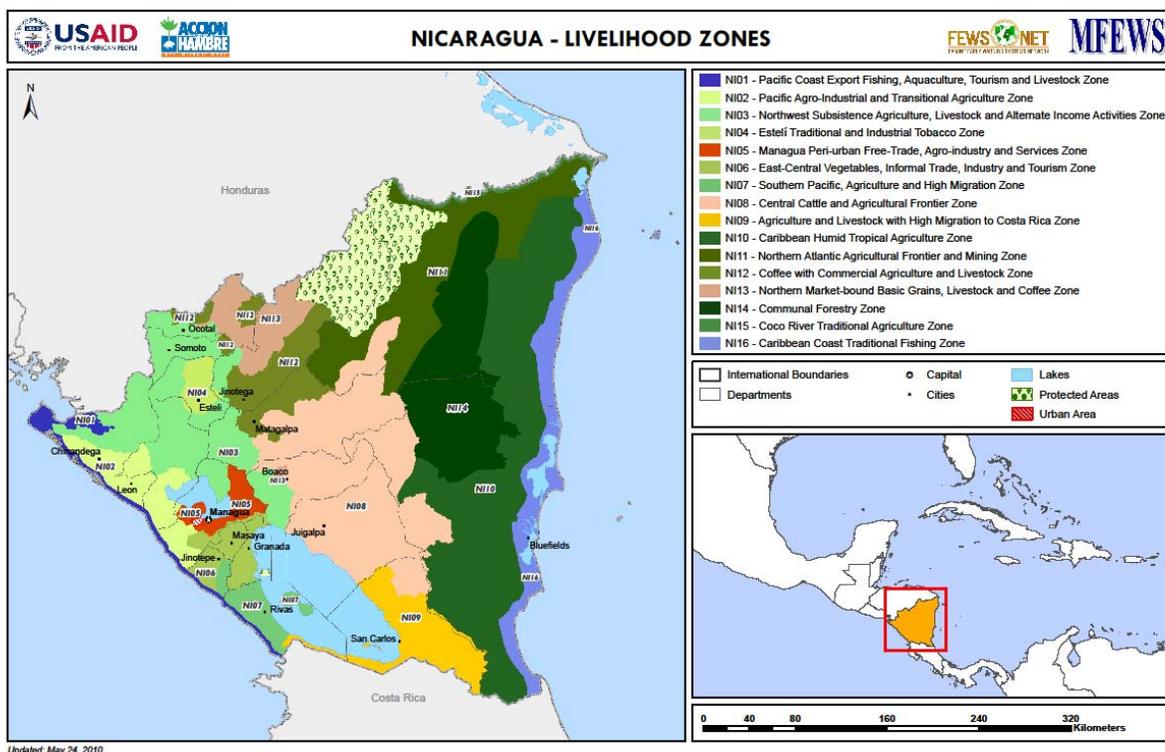




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LIVELIHOODS ZONING “PLUS” ACTIVITY IN NICARAGUA

A SPECIAL REPORT BY
THE FAMINE EARLY WARNING SYSTEM NETWORK (FEWS NET)

November 2009

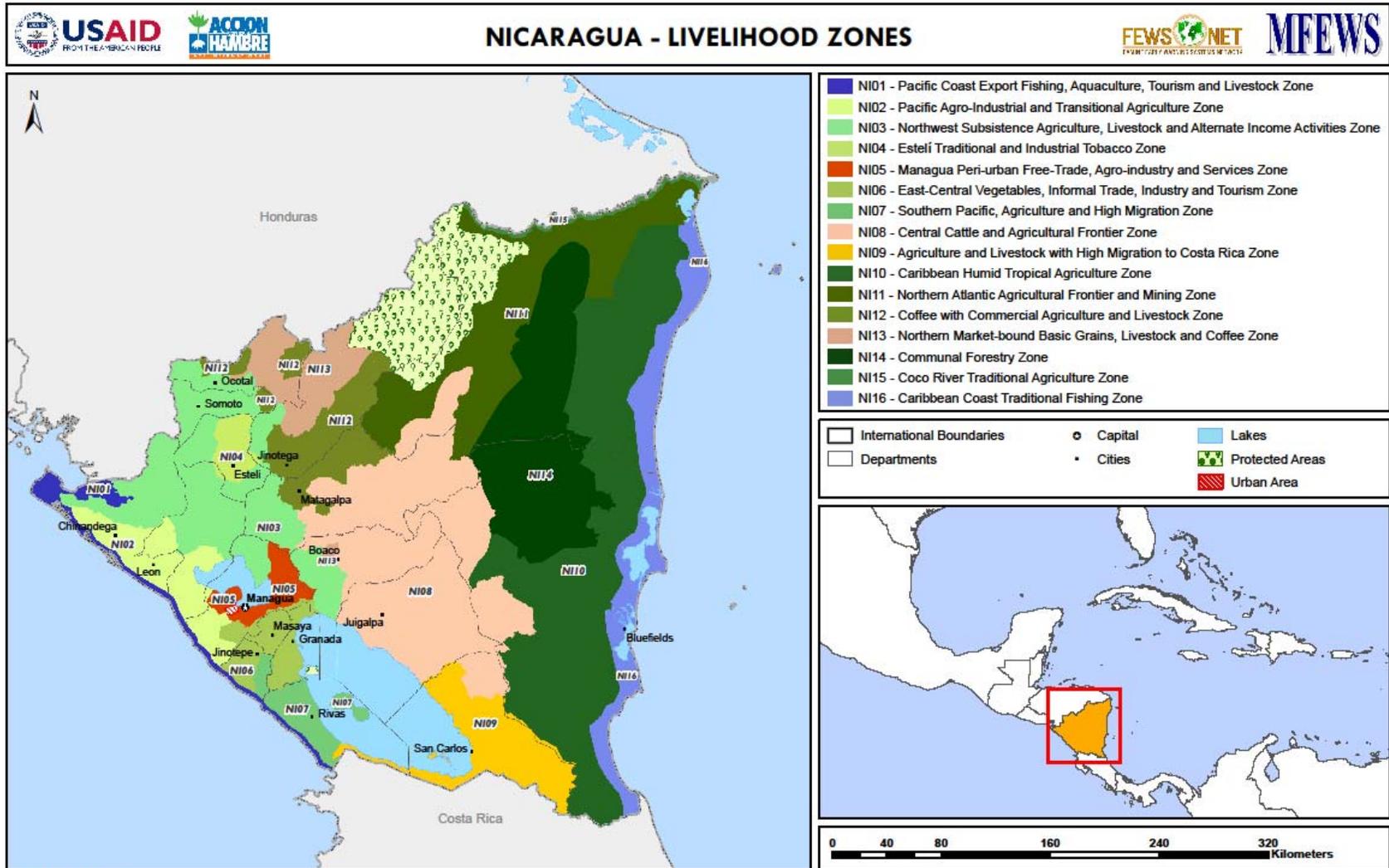
This publication was prepared by Stephen Browne of FEG Consulting and Adriana Moreno for the Famine Early Warning Systems Network (FEWS NET), in collaboration with the Acción Contra el Hambre.

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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Livelihood zone map



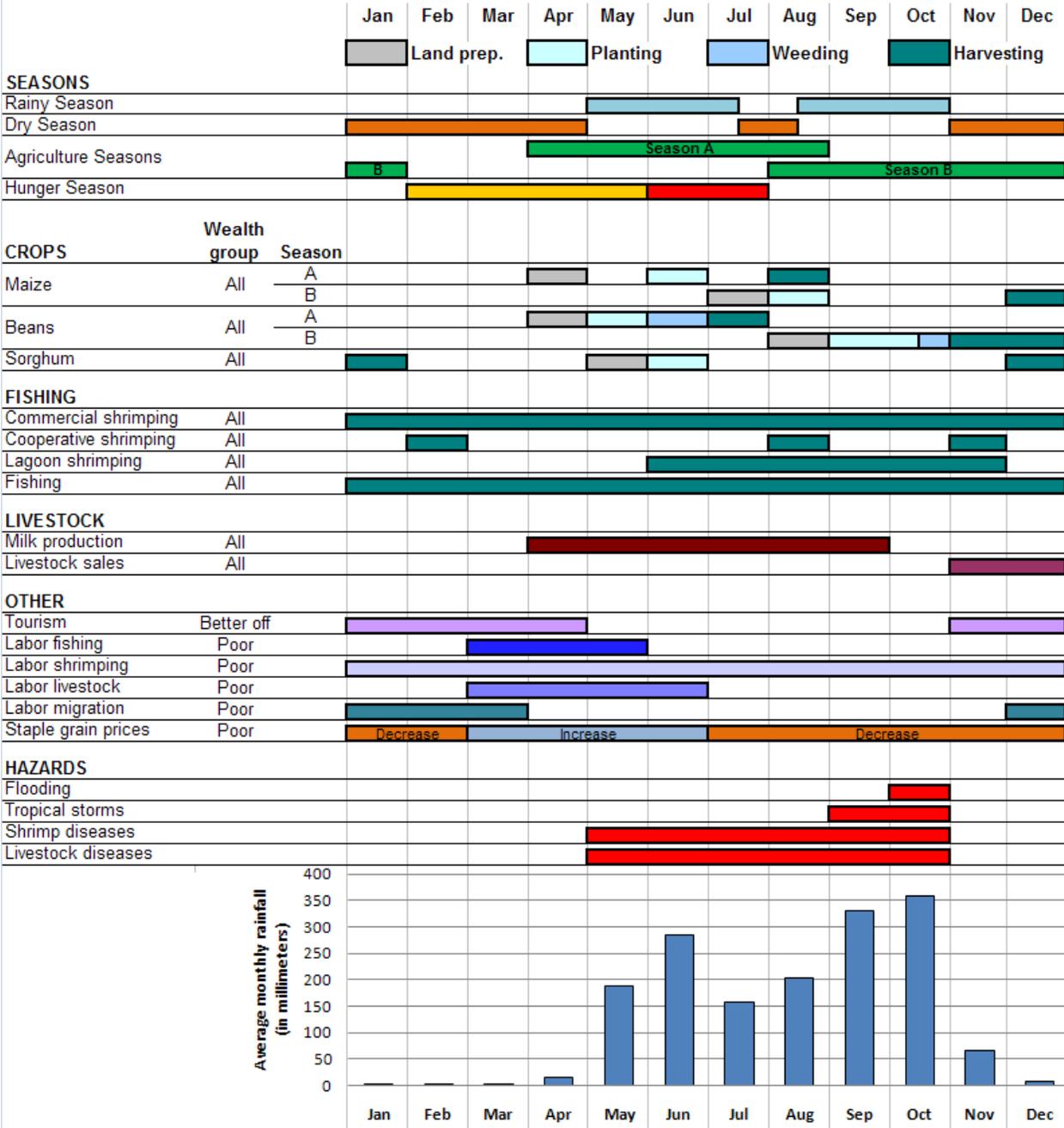
Livelihood zone descriptions

Livelihood Zone #1 – Pacific Coast Export Fishing, Aquaculture, Tourism and Livestock Zone		
Food Crops	Maize Sorghum	<p>This zone stretches along the Pacific Coast from the Honduran border south to Costa Rica. The distance from the shoreline inland varies, ranging from five to ten km. Annual rainfall varies between 800 and 1,500 mm. Fishing is the main driver of the zone’s economy providing temporary work for its residents. Industrial shrimp and shellfish companies export their products throughout the country and abroad. In addition to fishing-based activities, households take advantage of fertile volcanic soils to cultivate staple grains. Yard animals such as pigs and poultry are also kept by households and are used to supplement their food and cash needs.</p> <p>All households in the zone rely on the market to meet the majority of their annual food needs. The poor, who represent the majority of the zone’s population, also trade fish for grains and consume livestock and livestock products. The poor also have limited access to land through renting, sharecropping or lending, with an average of 1.75 hectares¹. Better-off households may also source food from their livestock but depend more on grains harvested from their plots.</p> <p>The main economic activity in the zone is shrimp farming and fishing. The labor demand for these activities supplies the zone’s poor with most of their annual income. Better-off households also benefit from the shrimp and fishing industry, earning most of their cash from larger-scale fishing operations and their shrimp farms. These households will supplement their annual earnings by selling livestock, livestock products (such as milk, cheese, meat and eggs) and some staple grains.</p> <p>There is a growing ecotourism industry, primarily in the protected areas, such as the delta of the Estero Real, the Cosiguina and Apacunca Volcanoes, creating employment and income generating opportunities; beaches at the west of Leon, Managua and San Juan del Sur, offer employment opportunities as well.</p> <p>Adequate road networks and reliable transportation services ensure year-round access to markets. Crops, livestock and livestock products that are not consumed by the household are sold locally and, to a lesser degree, at the larger regional markets located outside the zone. The zone’s main products, shrimp and fish, are sold to fish processing plants, national and international traders, or sold at larger regional markets.</p> <p>After a shock, households will engage in one or more coping strategies to offset any cash or food deficit created by a hazard. Poor households will increase the sale of labor, sell yard animals and reduce the amount and frequency of meals consumed. Better-off households may sell larger livestock, such as cattle, and increase the sale of crops in order to purchase cheaper grains.</p>
Sold Crops	Maize White sorghum	
Livestock	Pigs Poultry Cattle	
Cash Income	Daily labor Shrimp and fish sales Livestock sales Crop sales	
Main Markets	<p><u>Crops</u> Chinandega Leon Managua Rivas</p> <p><u>Livestock and fish</u> Chinandega Managua Rivas</p>	
Labor Migration	Within the zone or to Costa Rica (coffee) and El Salvador (sugarcane)	
Hazards	<p>Rain failure</p> <p>Shrimp and fish disease</p> <p>Water pollution</p> <p>Rise in staple food prices</p> <p>Tropical storms</p> <p>Flooding</p>	

¹ 2.5 manzanas.

Seasonal calendar

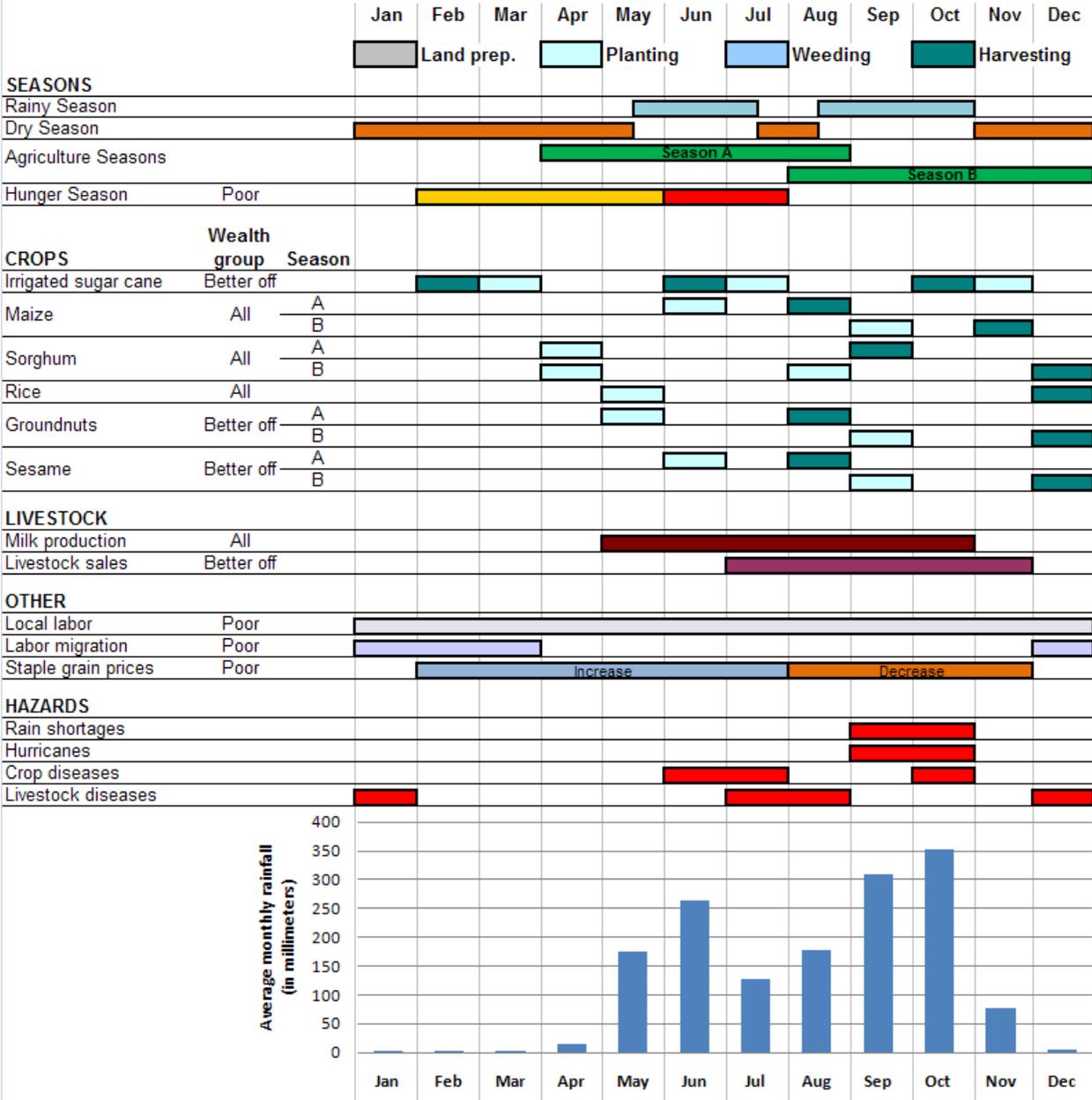
Zone 1: Pacific Coast Export Fishing, Aquaculture, Tourism and Livestock



Livelihood Zone #2 – Pacific Agro-Industrial and Transitional Agriculture Zone		
Food Crops	Maize Sorghum Rice Beans	<p>Located in western Nicaragua, this zone extends from the Pacific Coast inland, across parts of Chinadega, León, and Managua departments. The relief is very diverse, going from plains to rolling hills, with most of the land being undulating. The altitudes vary between 200 m in the plains to 1000 m above sea level, on the slopes of the volcanoes in the West. It rains six to seven months out of the year with a moderate dry spell between July and August. The 1,600 mm of average annual precipitation and fertile volcanic soils foster optimal conditions for crop production.</p> <p>The zone's economy relies on the employment generated from commercial agriculture, industry, mines, and livestock breeding. Sugarcane, oilseeds (sesame and peanuts) and grains are produced commercially, whereas maize, sorghum, beans and rice are produced by smallholders for consumption.</p> <p>Though there is high potential for agricultural production, access to land, especially among the poorer sectors of the population, limits the amount of crops that they harvest. The poor must, therefore, purchase most of their annual food needs, relying on crops and livestock products to fill remaining gaps. The difference in land ownership between poor and better-off households is highly skewed. The better-off typically own wide tracks of land and use hired labor and machinery to produce food and cash crops. Though better-off have the capacity to produce most of their food, they too will purchase food from the market.</p> <p>The poor source most of their annual revenue by supplying labor to better-off and commercial farms. They may also get cash by selling crops or livestock, but the amount earned from these activities is minimal compared to labor sales.</p> <p>The Pan-American Highway transects the zone, providing good access to Managua and other market towns. Most large towns have important markets, though the markets of León and Chinandega dominate the zone's commercial activities. Oilseeds and sugarcane are sold locally then transported out of the zone to the larger national and international markets. Livestock products are either sold locally or are transported to Managua for national level distribution.</p> <p>Poor households, which represent the majority of the zone's population, are more at risk to experience acute food and cash deficits from hazards. In order to curb food insecurity, the poor may leave the zone to look for temporary work, sell small stock, collect and sell firewood and rent out their land.</p> <p>High population density, and lack of investment and technical knowledge in agricultural production, lead to migration to the cities (to the urban informal sector) or to other countries (Costa Rica), or towards an over-exploitation of the scant resources, causing severe environmental damage.</p>
Sold Crops	Sugarcane Oilseed Basic grains	
Livestock	Pigs Poultry Cattle	
Cash Income	Crop sales Daily labor Livestock sales	
Main Markets	Leon Chinadega Managua Chichigalpa Corinto Posoltega	
Labor Migration	Within the zone or to Costa Rica, El Salvador	
Hazards	<p>Rain failure</p> <p>Hurricanes</p> <p>Environment degradation</p> <p>Rise in staple food prices</p> <p>Crop diseases and pests</p> <p>Livestock diseases and pests</p>	

Seasonal calendar

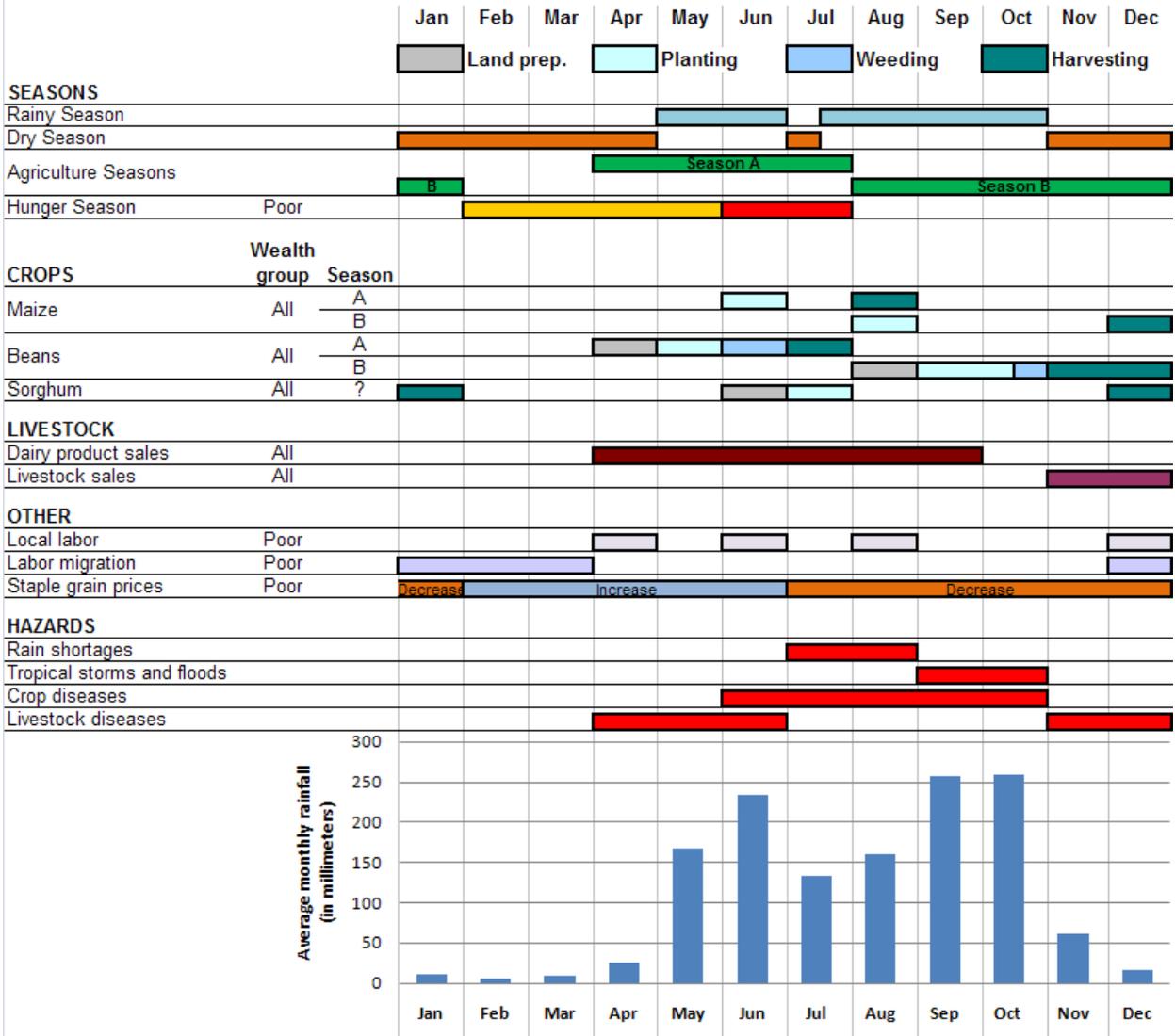
Zone 2: Pacific Agro-Industrial and Transitional Agriculture



Livelihood Zone #3 – Northwest Subsistence Agriculture, Livestock and Alternate Income Activities Zone		
Food Crops	Maize Beans Sorghum	<p>This hilly, semi-fertile livelihood zone is covered with light woodland and savannah pastures. The zone has a dry or semi-arid climate with a very rural population and intensive systems for staple grain, vegetables, and coffee. Grasses and brush are the predominant use of the land in the zone, followed by annual crops, principally maize, beans, and sorghum.</p> <p>The rainy season precipitates 800-900 mm annually and occurs from May to the beginning of November, with a short dry spell from mid-July to mid-August. The agricultural activities in the zone are based on subsistence-level production of maize, beans and sorghum. Chickens and pigs are also raised, mostly for consumption and, to a lesser degree, for cash.</p> <p>The two principal sources of food for the zone's residents are agricultural production and the market. Poor households are heavily dependent on purchased foods and, therefore, are more affected by staple food price increases. Better-off households typically have larger land holdings and can afford the necessary inputs required to maximize crop yields. They are capable of producing most of what they consume and complement harvests with purchased foods and livestock products.</p> <p>Agricultural labor is the primary source of income for the zone's poor, followed by crop sales and remittances. As in other zones, the poor will sell some of their crops immediately after the harvest, using the cash to purchase essentials. To supplement their income, especially during the lean periods before the harvest, the poor will also collect firewood, sell mud-derived artisanal products and engage in day labor in agricultural businesses. Better-off households rely more on crop production to meet their cash needs, but will also sell livestock and receive remittances.</p> <p>Although the Pan-American Highway traverses the zone, distances from many rural areas to market centers are far. Depending on the location of the household, market visits can be exhausting and time consuming. Many poor households are unable to travel to local markets frequently, so they often will sell harvest surpluses to intermediaries or <i>coyotes</i>. One disadvantage of selling to <i>coyotes</i> is farmers tend to earn less than what they would normally earn at the market. Lack of market price information and desperation for immediate cash force many farmers to sell to <i>coyotes</i>. Grains sold in municipal markets are taken to larger markets within and outside the zone. The main livestock sold in the local markets are pigs and chickens, the latter of which are also sold outside the zone.</p> <p>Rain failure or erratic rainfall is a chronic impediment to crop production in this zone. When rains fail, it not only reduces food for household consumption, but also reduces the demand for labor during normal harvesting periods. Additionally, a limited supply and high demand of grains in the market will raise food prices, making it difficult for the poor to afford food. With limited income earning options, many poor households will leave the zone in search of work, collect and sell firewood and sell small stock.</p>
Sold Crops	Sorghum Maize Beans	
Livestock	Pigs Poultry Cattle	
Cash Income	Labor Crop sales Livestock sales Remittances	
Main Markets	Leon Chinandega Managua Maltagalpa Estelí	
Labor Migration	To municipalities' main cities within the zone, to the coffee zone and to El Salvador, Honduras and Costa Rica	
Hazards	<ul style="list-style-type: none"> Rain failure Soil contamination Staple food price increase Tropical storms and flooding Livestock diseases and pests Crop diseases and pests 	

Seasonal calendar

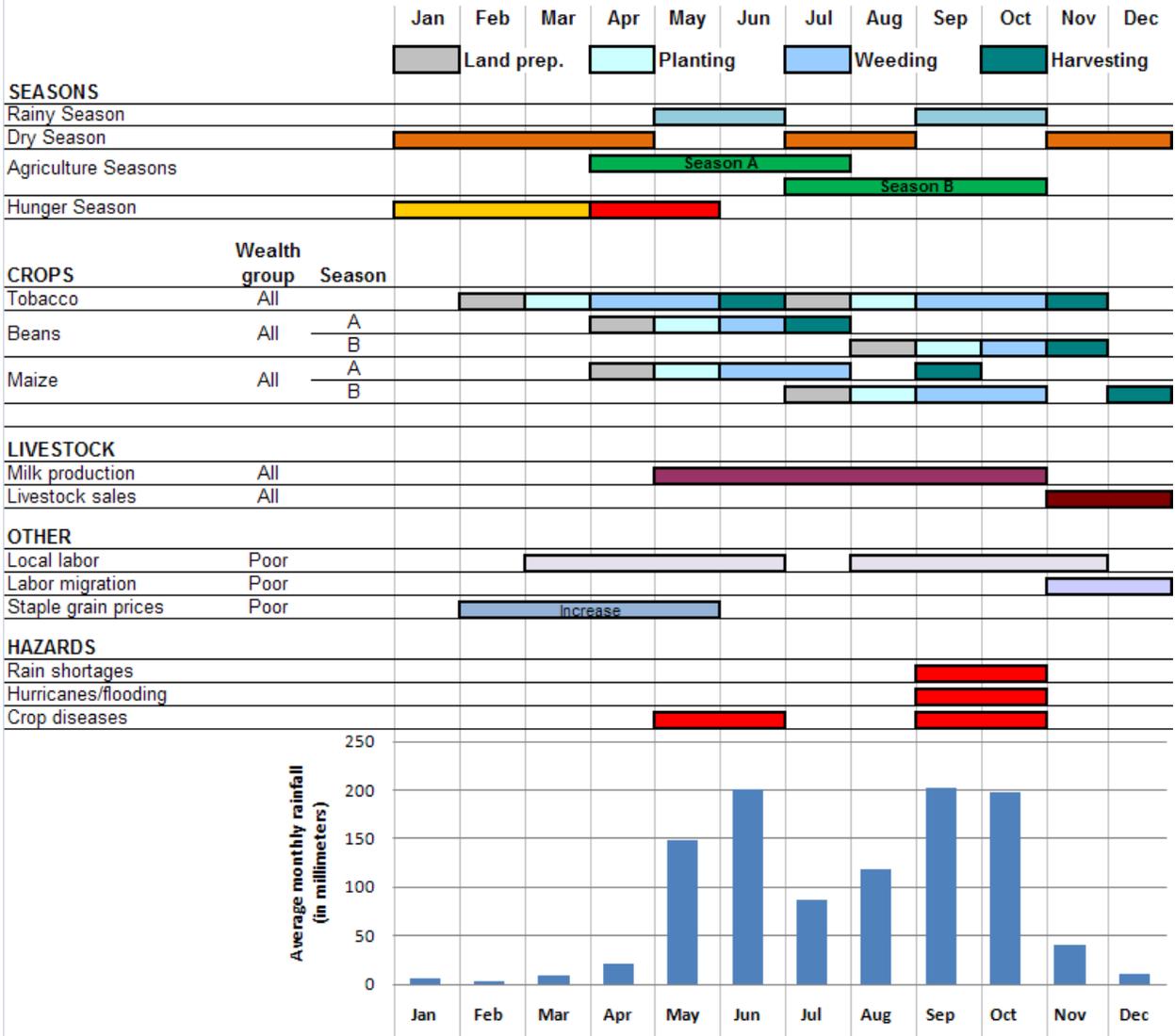
Zone 3: Northwest Subsistence Agriculture, Livestock and Alternate Income Activities



Livelihood Zone #4 – Estelí Traditional and Industrial Tobacco Zone		
Food Crops	Maize Beans Sorghum	Situated in the department of Estelí, this predominately hilly zone depends on the production of basic grains, tobacco and manual labor. Irrigated tobacco plantations feed the demand of local cigar factories and offer year round employment opportunities for the zone’s labor force. In addition to tobacco, households rely on the production of staple grains and vegetables. The latter is produced mostly for sale, while the former is grown for consumption and sale. Rainfall averages 1,100 mm per year.
Sold Crops	Tobacco Maize Beans Vegetables Tubers	
Livestock	Cattle Pigs Poultry	Like most poor households in central and west Nicaragua, land holdings and inputs limit the amount of crops produced. For this reason, poorer households rely on the market to source most of their food, filling additional needs with what they produce from their fields and grain received as in-kind payment. On the opposite side of the wealth spectrum, better-off households get most of their food from their own fields, supplementing additional needs with purchased foods and livestock products.
Cash Income	Daily labor Crop sales Livestock product sales	
Main Markets	Estelí Jalapa Nueva Segovia Managua	Labor sales, either on better-off household farms or in the tobacco industry, are the primary source of income for the poor. Some may also sell a portion of their harvest, but the amounts earned pale in comparison to labor sales. Crop harvests typically occur during the lean season, and the urgency for cash to purchase both food and non-food essentials pushes the poor to sell when prices are lowest. For those that own cattle, dairy product sales are another income-earning activity.
Labor Migration	To the coffee zone or to El Salvador	
Hazards	Rain failure Floods Crop disease Environment degradation Hurricanes Livestock disease and pests???	The Pan-American highway cuts through the zone, connecting it with the major markets within the departments of Estelí, Nueva Segovia and Managua. Regularly maintained feeder roads connect most of the rural population with larger regional markets, ensuring a steady flow of commodities. Basic grains are mostly sold and distributed within the zone, while vegetables may travel further to the (peri-) urban markets of Managua. Tobacco is mostly sold to the factories located in the zone and is also sold on the international market. Crop production, whether commercial or small-scale, is the foundation for household livelihoods. Hazards, such as rain failure, crop disease or floods, will have a negative impact on how households access cash and food. To compensate for any losses brought on by hazards, households will temporarily migrate to urban areas or outside the zone to look for work, sell livestock, consume wild foods and ask relatives to increase remittances. Better-off households tend to reduce the employment of unskilled labor.

Seasonal calendar

Zone 4: Esteli Traditional and Industrial Tobacco Zone

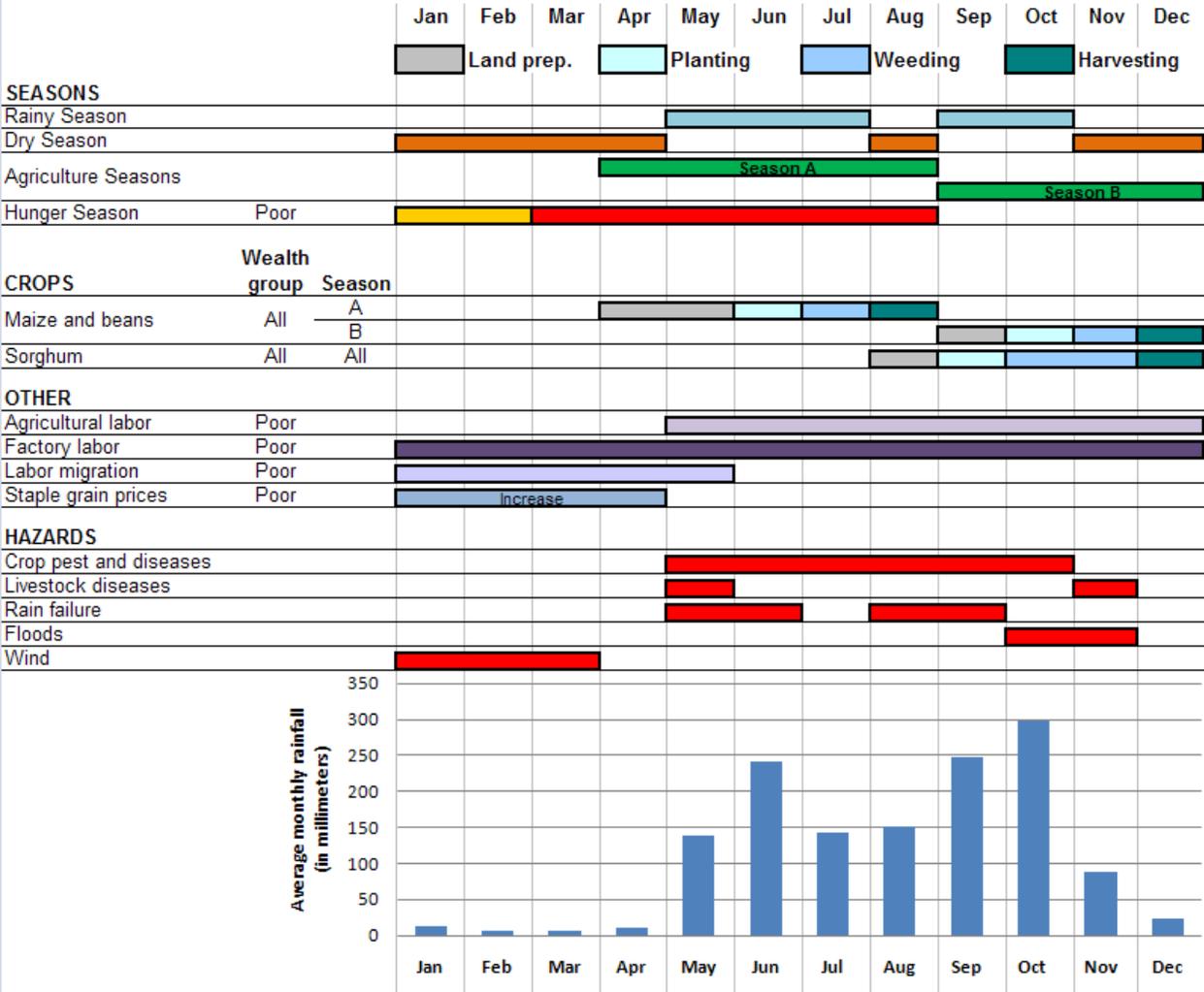


Livelihood Zone #5 – Managua Peri-Urban Free-Trade, Agro-Industry and Services Zone		
Food Crops	Rice Beans Maize Sorghum Vegetables	Situated close to the capital city, this zone's location offers good access to main roads, markets, the airport and employment. This rural region is characterized by a high population density that ranges from 160 to 300 inhabitants per kilometer squared, a large number of smallholders and strong linkages to the urban economy. The soil varies substantially. The fertile lands are in the wet and flat areas south of the city of Tipitapa. In the north, the land is more rocky and infertile, with thick brush and grass. The rains are favorable, ranging from 1,200 to 1,600 mm annually, from south to north. However, the depth of the aquifer makes access to potable water difficult.
Sold Crops	Vegetables Maize Beans	
Livestock	Poultry Pigs Goats	
Cash Income	Labor (employed and manual) Trade (whole sale and petty) Remittances Handicraft sales	The foundation of this zone's economy is characterized by smallholder farming (staple food cultivation, minor livestock rearing and market gardening), large farms (livestock rearing, fodder and staple food cultivation) and manual labor in the free industry, services and trade zones known as <i>maquilas</i> .
Main Markets	Managua Masaya Granada Mateare Tipitapa	Land use differs among wealth groups. The better-off use their land mainly for livestock rearing and the production of animal fodder and cereals. Though they have the capacity to meet their food needs from crop production, they opt to sell what they produce to purchase food. Poor households, who have land, grow staple food crops including maize, beans, sorghum and some vegetables. As in other zones, the poor are reliant on crop production; however, they still need to purchase most of what they consume. They will also consume poultry and livestock products according to need. There is a segment of the poor population who do not have access to land; they must purchase all their food.
Labor Migration	To Jinotega, Estelí, Costa Rica or to the United States, and now there is higher the flow to Spain	Artisan activities in the region are very developed and diverse, including shoes, tailoring, baskets, toy making and metal sheet working.
Hazards	Rain failure Crop diseases and pests Livestock disease and pests Rise in prices of essential food and non-food products Lack of stable employment Floods/wind	Even in a good production year, poor households are unable to cover their food needs. Consequently, they depend on income from manual labor to purchase food, especially during the annual hunger season. This is when household food stocks are dwindling and staple food prices increase. The poor consume most of what they grow but will sell vegetables or grains in order to buy cheaper foods. In addition to these income sources, they will receive remittances from family members living outside the zone or abroad. Market access in the zone is good due to the availability of regular transportation (buses and trucks for hire) and well maintained roads. The zone's market offers a variety of food and non-food goods throughout the year, and staple food prices are similar to prices in Managua. Migration occurs mainly within the months of November to April, when both male and female members of poor households tend to migrate to Costa Rica to work in construction, as domestic servants and/or in the coffee harvest. They also go to other areas within Nicaragua, namely Jinotega or Estelí to harvest coffee between the months of November to January. The unique element of this zone is its connection with the <i>maquilas</i> and other industries within the zone. Though both sides of the wealth spectrum rely on agriculture, they also, if not more so, depend on the

employment provided by the *maquilas*. Changes in government, international and national economic crises all threaten normal *maquilas* operations and, in turn, stable income opportunities for the zone's majority. Households' dependency on purchased foods and the threat of rising food prices could increase many households' risk of food insecurity.

Seasonal calendar

Zone 5: Managua Peri-urban Free-Trade, Agro-industry and Services Zone



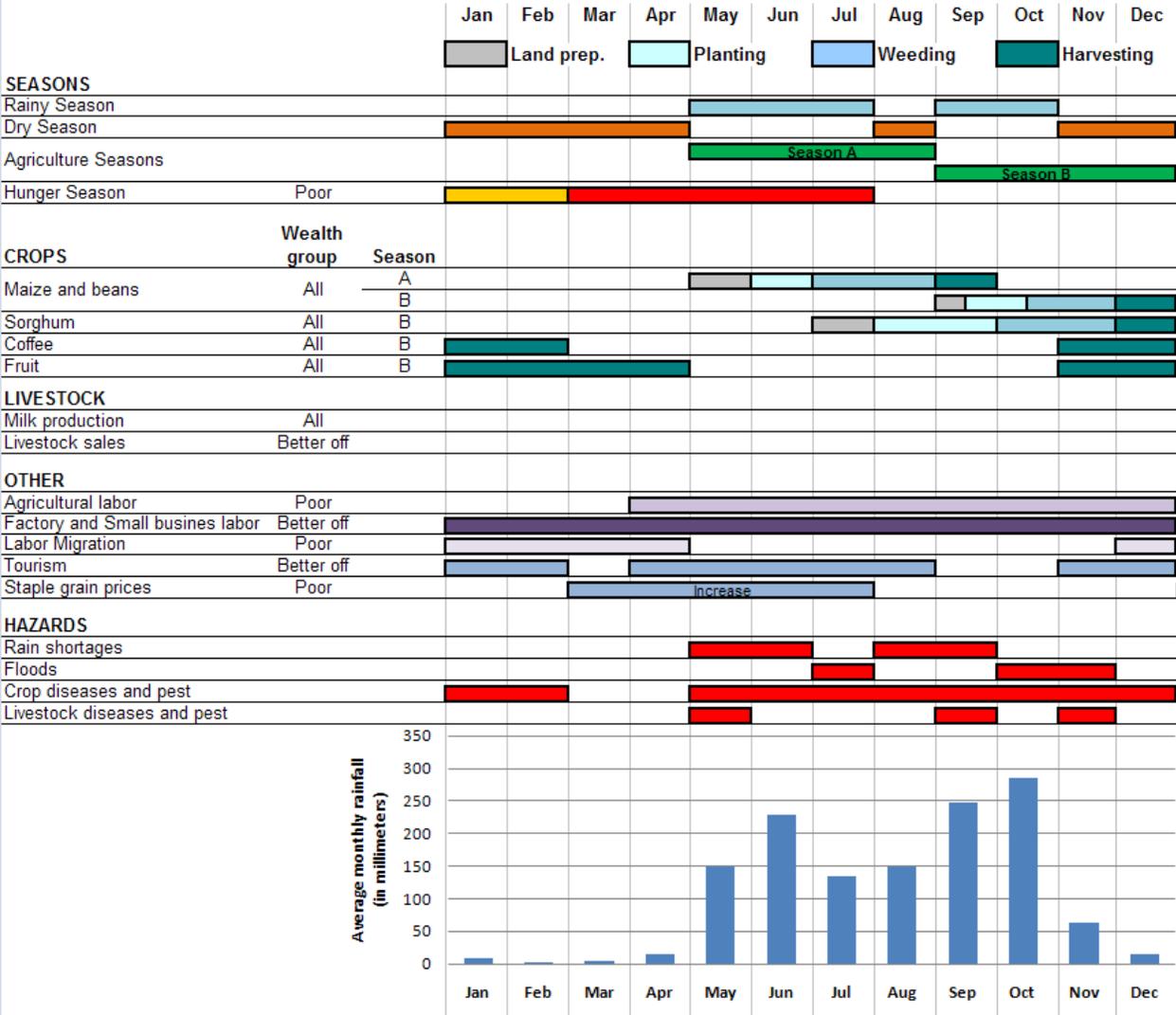
Livelihood Zone #6 – East-Central Vegetables, Informal Trade, Industry and Tourism Zone		
Food Crops	Maize Beans Sorghum	This zone is one of the most entrepreneurial of the country; economic activities are well diversified and include agriculture, fruit production, plants, flowers, coffee, handicrafts, free trade zones and tourism (principally to Granada). Fertile volcanic soils and 1,400 mm of average annual rainfall provide an optimal environment for agriculture and livestock.
Sold Crops	Grains Coffee Fruits	
Livestock	Poultry Pigs Cattle	There are three regions in this zone: a low region with pineapple cultivation in Ticuantepe; a coffee-growing region with citrus fruits, pitaya, chayote squash, and musaceae in the higher areas like La Concepcion, La Meseta; and, in the Cuesta de la Meseta, southeast of the city of Masaya, a policultural region with basic grains, tubers, flowers, with a diversity of fruits, especially mangos. The presence of coffee increases proportionally as the altitude increases.
Cash Income	Labor (skilled and unskilled) Crop sales Livestock sales Micro-enterprise	
Main Markets	Masaya Jinotepe Granada	Agriculture is characterized by the farming structure known as <i>minifundios</i> , where the individual farmers have very small plots of land. Cattle farming is not as important an income source in the lower areas of the zone, where substantial commercial cattle farming is found.
Labor Migration	To capital city or to Costa Rica and El Salvador	The poor have limited and irregular access to land (from 1.75 to 5.5 hectares ²), which they rent or sharecrop. They mainly cultivate basic grains, tubers, musaceos and fruits for personal consumption and sale. All households rely heavily on food purchases, but for different reasons. The poor are particularly dependent as they do not have the capacity to produce for a full year nor store their harvest. They typically sell immediately after the harvest to obtain cash to purchase essentials. The better-off have a high purchase rate, as they demand a broader range of food items in addition to what they produce, and because they mainly produce for selling and not for subsistence.
Hazards	Rain failure Excessive price fluctuations Floods Crop disease and pests Livestock disease and pests	The sale of manual labor is the primary source of income for most poor households, followed by crop and livestock sales and remittances. Poor households find employment on commercial farms, industry, free-trade zones and on the farms of the better-off. The better-off earn most of their cash through small agriculture and non-agriculture-based micro-businesses, but will also sell crops and livestock, in addition to skilled labor. Although many roads are dirt, they are regularly maintained, providing good year-round access to the most important markets within the zone and those in Managua. When household food reserves are depleted, they buy rice, maize, and beans. Some travel to the main Managuan markets of Mayoreo and Oriental while others buy from small, family-run stores locally (who themselves buy at the markets in Managua). Crafts are sold at local markets (Masaya, San Juan del Oriente and Catarina) and in Managua, as well as from roadside stands. Virtually all coffee in this zone is bought by a local exporter—a member of a larger international group—which exports the coffee out of the country. To offset the effects of hazards, the poor migrate outside the zone (sometimes to Costa Rica) to look for work, sell additional livestock,

² From 2 to 5 manzanas

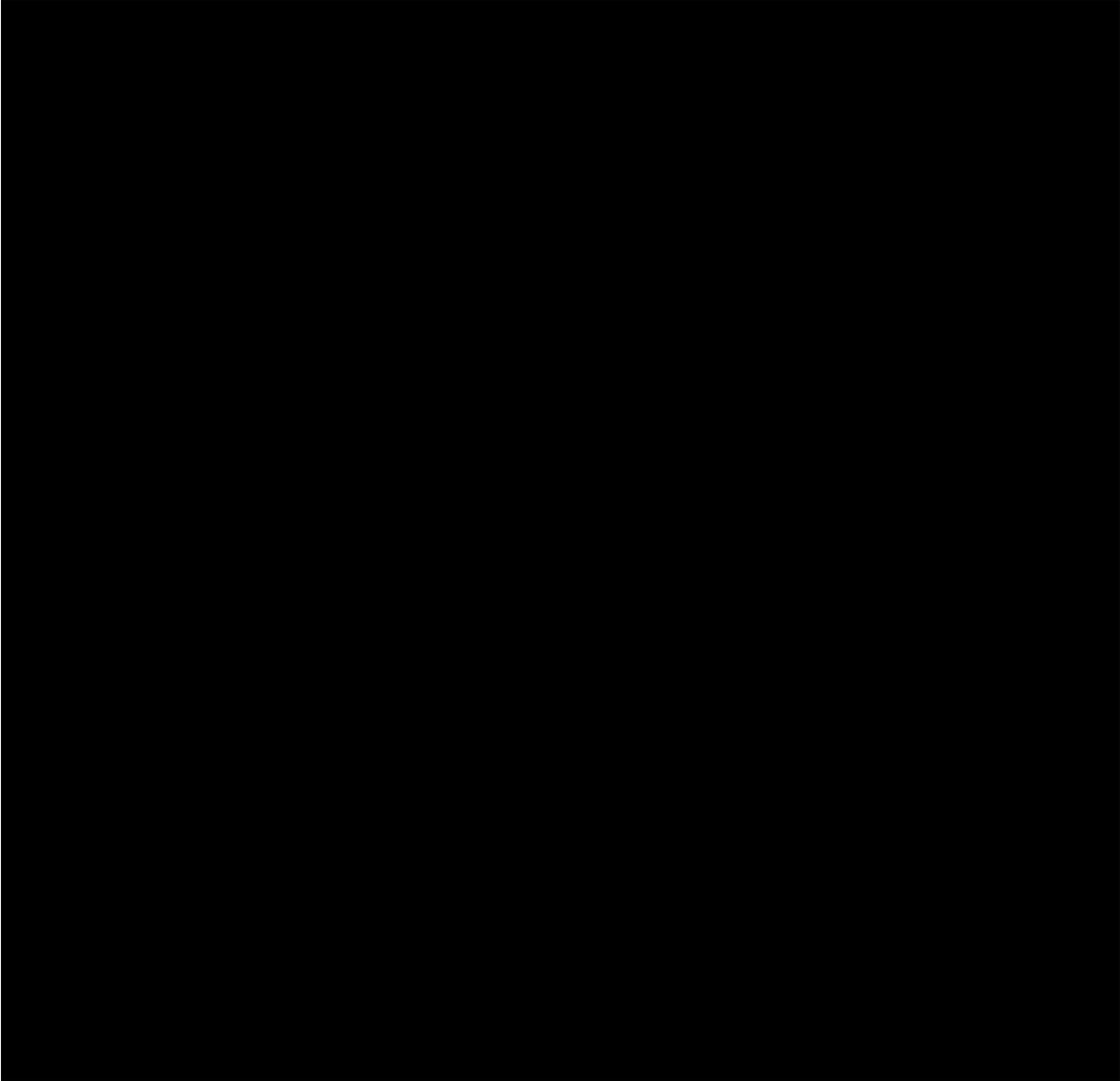
		increase local labor sales, collect and sell firewood and reduce the frequency and quantity of food consumed.
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Seasonal calendar

Zone 6: East-Central Highly Diversified Agriculture, Agro-industry, Industry and Tourism



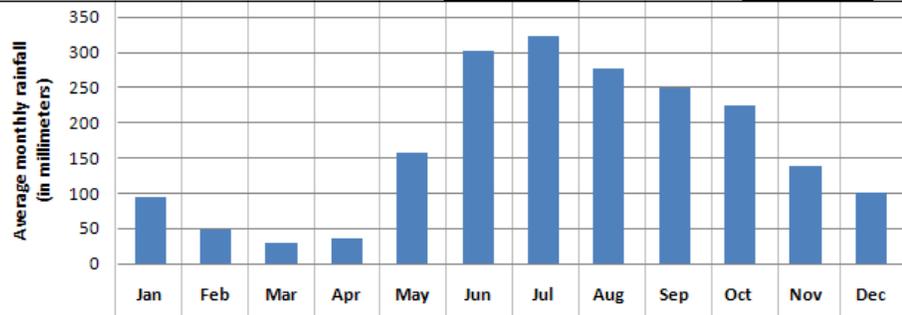
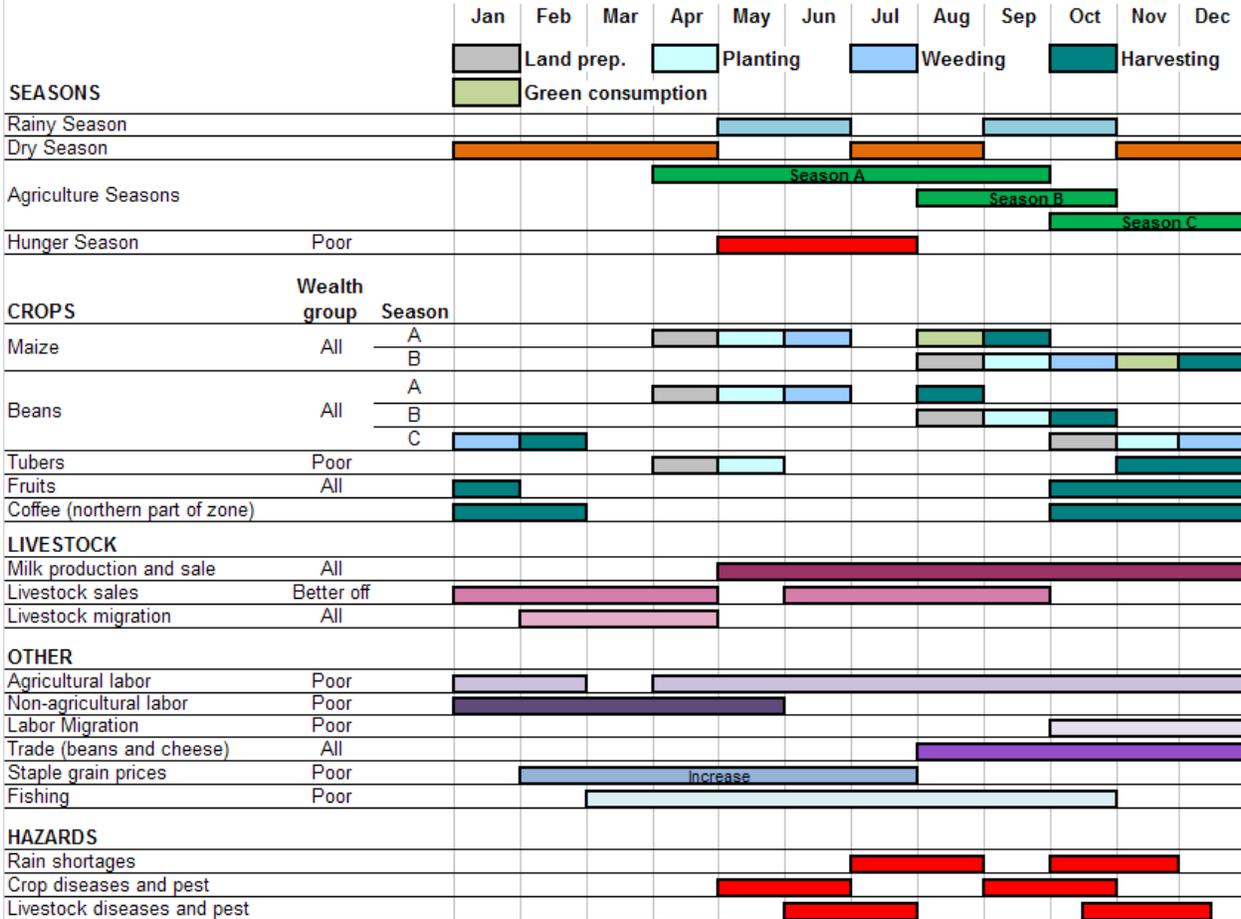
Livelihood Zone #7 – Southern Pacific, Agriculture, Tourism and High Migration Zone		
Food Crops	Rice Beans Maize Sorghum	<p>This zone is located in the Southern Pacific, bordering with Costa Rica. The rainy season for this zone is from May to November, with a dry period, known as the <i>canícula</i>, between July 15th and August 15th. Average yearly precipitation reaches 1,400 mm in most of the zone. Agricultural production is dependent on rainfall throughout the zone. The principle subsistence crops are beans, rice, sorghum and maize. The principle cash crops are plantains, bananas, watermelon, papaya, pomegranate and other fruits, basic grains and sugar cane (Nandaime and Rivas).</p> <p>Food purchases are important for all households in the zone. Better-off households are involved in commercial agriculture, producing crops for sale, and therefore purchase the bulk of their annual food needs. Poor households are unable to sustain themselves with their own crop production and must buy more than half their annual food requirements. The poor will also work on the farms of better-off households, receiving grains, eggs and milk as payment.</p> <p>Agriculture and livestock are important sources of income and subsistence for the majority of households in the zone, irrespective of wealth group - if not directly as a producer, then as source for the sale of labor. The poor will sell a portion of their crops immediately after harvest in order to purchase needed food and non-food essentials. Though not as significant as labor and crop sales, poorer households will also get revenue from petty trading. Better-off earn most of the money from crop and livestock sales, but will also engage in local commerce.</p> <p>The Pan-American highway passes through the zone, linking major markets with rural communities and Costa Rica. Many traders and producers sell their goods at the large market in Rivas, as well as in the markets in Granada, Masaya and Managua. Although most of the labor demand falls within the zone, many households will travel to Costa Rica for the coffee harvest or to find off-farm opportunities in the domestic and construction sectors.</p> <p>Poor households will engage in a number of post-hazard strategies to compensate for lost production or earnings. The most common coping strategy is to temporarily migrate to Costa Rica or nearby fishing areas in search of employment. Additionally, the poor will engage in the petty trade of mangoes, vegetables or legumes, rice pudding, candy and soft drinks.</p>
Sold Crops	Maize Beans Fruits Sugar cane	
Livestock	Pigs Poultry Cattle	
Cash Income	Crop sales Daily labor Trade Commerce	
Main Markets	Rivas Jinotepe Managua Masaya	
Labor Migration	To Costa Rica	
Hazards	<p>Rain failure</p> <p>Floods</p> <p>Crop disease and pests</p> <p>Tropical storms</p> <p>Livestock disease and pests</p>	



Livelihood Zone #8 – Central Cattle and Agricultural Frontier Zone		
Food Crops	Beans Maize Rice Fruits Vegetables	<p>This zone plays an important role in the food supply of the country. It is of medium altitude (200 to 500 m above sea level) and in the northwestern area, in the Rio Coco basin, there is an ample fringe of land composed of high valleys. The central and southeastern parts are composed of irregularly shaped mesas and some plains. The average annual rainfall in this large zone varies between 1,400 to 2,000 mm from October to May. These conditions favor the <i>apante</i> production.</p> <p>This zone is characterized by diversified production systems. However, livestock and staple grain production are dominant. This is reflected in land use practices that prioritize pastures (more than 50% of the cultivated area). Forest areas occupy less than 10% of the total surface area. Permanent cultivation does not constitute a significant use of the land. Dense brush is tied to the production of grains and the establishment of pastures. Those residing along the northern fringes of the zone may also produce coffee.</p> <p>Markets are the most important source of food for all wealth groups, followed by own crops. Agricultural production, in addition to meat and milk, is also important for all households, but to a lesser degree for the poor who typically have less land, less access to agricultural inputs and fewer livestock.</p> <p>The sale of livestock and livestock products such as milk, meat and cheese are the two dominant sources of income for the better-off households. Labor opportunities offered by better-off households, in either cattle ranching or agriculture, is the principle source of cash for the zone's poor.</p> <p>Market access varies slightly within the zone. For the most part, the zone's majority can access local markets with limited difficulty, except during the rainy season when the state of roads limits the commercial flow of products. Regularly-maintained road networks link smaller markets with larger regional and national markets. Grains that are not consumed by the household are sold locally to intermediaries, who transport crops to regional markets. Dairy products are also sold locally or in Managua, and cattle are exported outside the zone to Managua and abroad.</p> <p>The main hazards in the zone include erratic rainfall, and cattle and crop diseases, all of which affect employment in the cattle and agricultural sectors. Households will employ a range of strategies to compensate for losses of food and/or cash. These include the sale of livestock (for the poor this usually is small stock), increased sale of labor and community organizing. The latter is a strategy that serves to consolidate community concerns and petition for assistance from government institutions or non-governmental organizations.</p>
Sold Crops	Coffee (more in the north) Beans Rice Fruits Vegetables	
Livestock	Cattle Pigs Poultry	
Cash Income	Daily labor Livestock sales Livestock product sales Crop sales	
Main Markets	Boaco Juigalpa Chontales Managua	
Labor Migration	To the coffee zone and Costa Rica	
Hazards	Rain failure Crop disease and pests Livestock disease and pests Environmental degradation	

Seasonal calendar

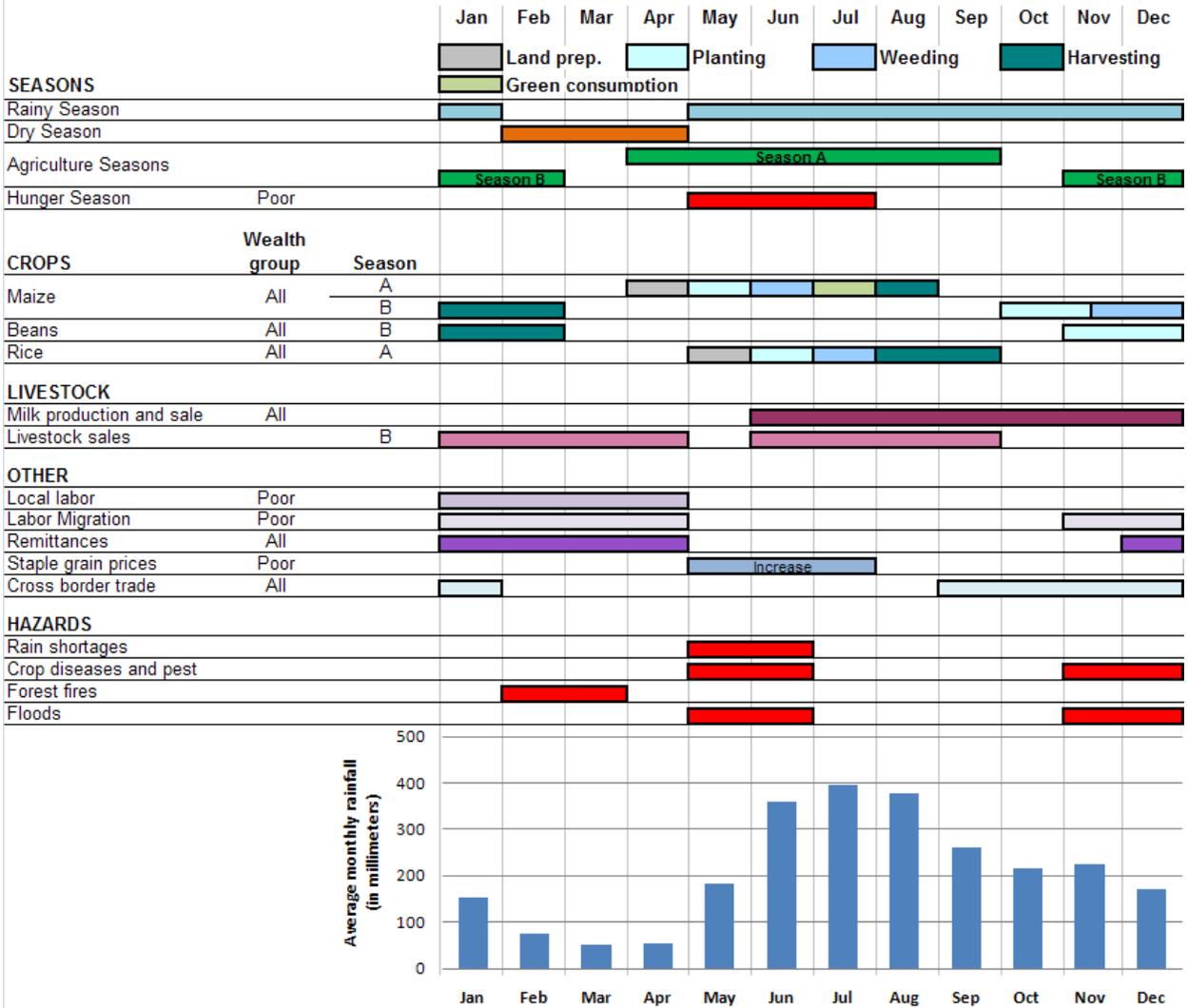
Zone 8: Central Cattle and Agricultural Frontier



Livelihood Zone #9 – Agriculture and Livestock with High Migration to Costa Rica Zone		
Food Crops	Rice Beans Maize	<p>This zone borders the southern part of Lake Nicaragua and follows the banks of the San Juan River along the border with Costa Rica. The zone’s tropical-humid climate includes a ten-month rainy season that lasts from May until February with annual precipitation of 2,600 mm. Unlike most of the other zones in Nicaragua, poor households have adequate access to land and engage in subsistence agriculture. The principle mixed-farming products produced by the poorer households are maize, beans, tubers and chicken eggs and meat.</p> <p>The poor in this zone are capable of fulfilling more than half of their annual food needs through crop production, filling the remaining gap from in-kind payment of grains, market purchases and livestock products.</p> <p>Though the better-off have access to more land and have sufficient resources for crop production, they purchase most of their food. Most crops produced by the better-off are sold; they will, however, reserve a portion of their harvest for household consumption and as payment to their day laborers. The better-off also consume milk, cheese and meat from cattle throughout the year, but this does not represent a high percentage of annual consumption.</p> <p>Poor households represent the majority of the population and generate their income from the sale of their unskilled, manual labor on the citrus plantations within the zone and from the coffee, plantain, tuber and citrus plantations in Costa Rica. Additionally, both men and women will migrate to Costa Rica to work in construction or as domestic laborers in the urban areas.</p> <p>Market access in the zone is difficult. Poor road and highway conditions limit commerce within the zone and with the intermediary markets outside the zone. This makes it difficult for poorer households, who have limited access to transportation, to access affordable food. An alternative is to transport goods by boat via Lake Nicaragua and the San Juan River. However, this method of transportation is typically expensive and only used by better-off households. During the months before the <i>primera</i> harvest, when cereal reserves are low, people tend to purchase more. To meet the demand, local merchants import cereals from other zones and sell them at elevated prices. During this period, many people migrate to Costa Rica to sell their labor to help cover increased food costs.</p> <p>The zones proximity to Costa Rica allows easier access to labor markets in time of need. When a hazard occurs, additional members of poor households will migrate to Costa Rica or Managua in search of work. Additionally, they may sell fish or firewood to earn extra cash for essentials.</p>
Sold Crops	Beans Rice Roots and tubers Citrus	
Livestock	Pigs Poultry Cattle	
Cash Income	Daily labor Crop sales Livestock sales Trade	
Main Markets	Rivas San Carlos Juigalpa Acoyapa Boaco	
Labor Migration	To Costa Rica	
Hazards	Floods Rain failure Crop disease and pests Forest fires Limited market access	

Seasonal calendar

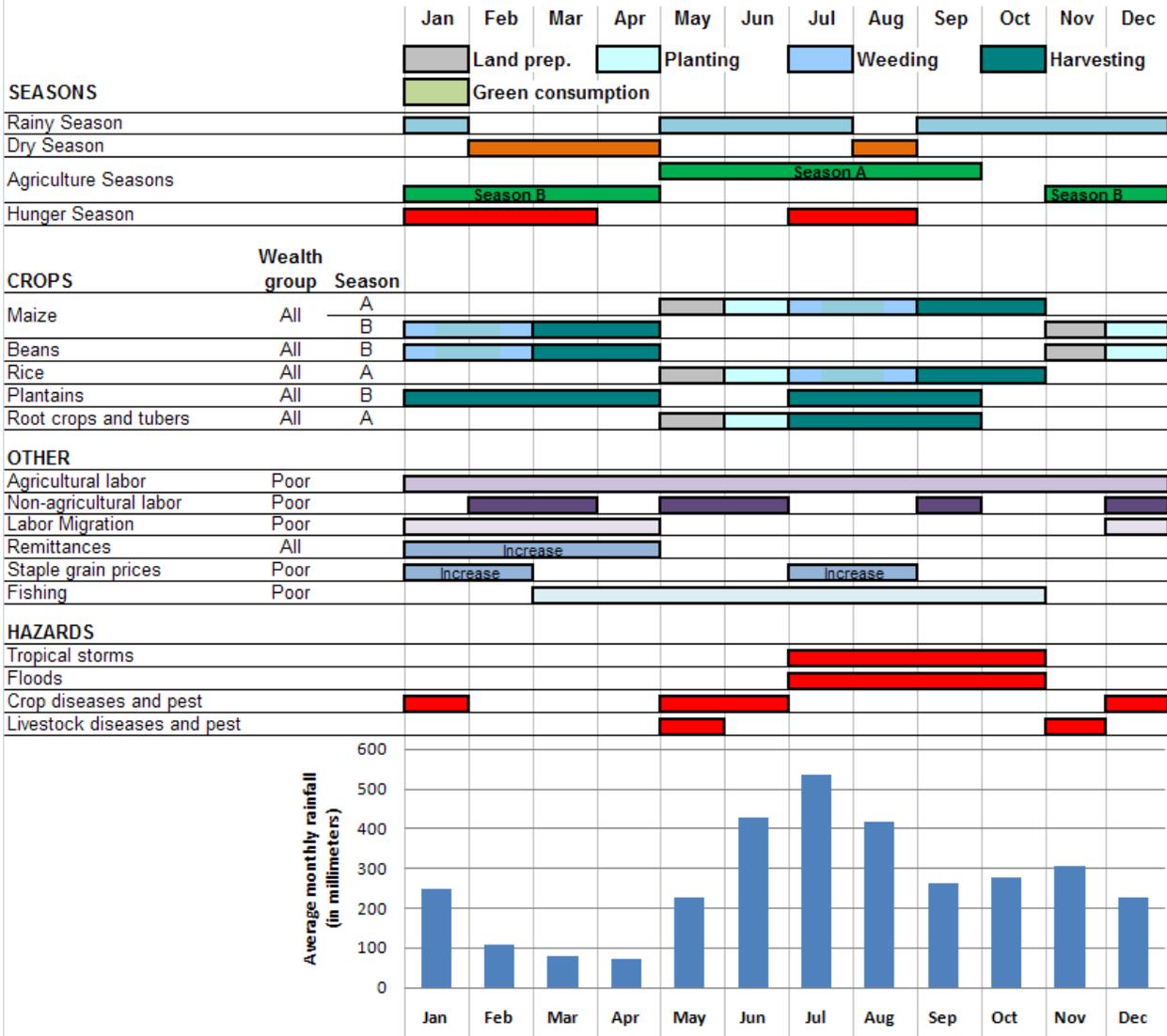
Zone 9: Agriculture and Livestock with High Migration to Costa Rica



Livelihood Zone #10 – Caribbean Humid Tropical Agriculture Zone		
Food Crops	Rice Beans Plantains	<p>This flat, sparsely populated forest zone stretches across the center of RAAN and RAAS departments and into the southeastern corner of San Juan del Rio. All households depend on subsistence agriculture to meet most of their food and cash needs. Beans, rice and plantains are produced for household consumption while tubers, root crops, as well as bean and plantains, are sold locally for cash. Pigs and poultry are mostly raised for household consumption; however, some households will sell them locally according to need. Cattle ranching is also common but is more dominant among some in the western part of the zone. Rainfall averages 3,200 mm per year.</p> <p>All households rely on their own production (crops and livestock) as their primary source of food; however, the amounts harvested vary according to wealth group. Poor households typically have smaller land holdings, limited access to inputs and labor, and therefore are unable to maximize their yields. Though crop production is their primary source of food, the number of months they are capable of sustaining themselves with their reserves is less than their better-off neighbors. Once their food stocks expire, they must rely on the market to meet their remaining needs. The consumption of livestock products, eggs, milk and cheese is another significant source of food, though their contribution to a household's annual food needs depend on livestock ownership. Typically, poorer households will rely less on their livestock because they own few animals. Throughout the zone and across all wealth groups, households will complement their diets with fish and wild animals.</p> <p>As in other zones, the sale of labor is the main source of income for the poor. Most labor is sold at various African Palm plantations within the zone, on better-off farms, and in the fishing sector. The poor will also supplement their income by selling a portion of their crops immediately after harvest and/or selling timber from the local forest. Crop sales, in addition to livestock, are the main sources of cash for the better-off. Some will also supplement their income by selling timber and precious wood to purchasers from Managua and abroad.</p> <p>Market access is substandard due to geographic remoteness and lack of adequate infrastructure. Aside from local markets, there are no major markets within the zone. Though the commercialization of crops and livestock is minimal, intermediaries from Siuna, Bonanza, Rosita and Nueva Guinea will import maize and beans. Most of the timber is sold directly to the Managua-based company <i>Maderas del Pacifico</i>.</p> <p>During times of crisis, households in this zone have limited strategies to recover from a shock. For most, the collection and consumption of wild fruits and roots, fishing and hunting are the only options. Some may migrate out of the zone to nearby African Palm plantations, gold mines or the coast in search of employment. Revenue earned from employment is sent back to the zone and used to purchase food.</p>
Sold Crops	Beans Roots and tubers Plantains	
Livestock	Pigs Poultry Cattle (in the western part)	
Cash Income	Daily labor Crop sales Trade Timber sales	
Main Markets	Local markets Rama Nueva Guinea	
Labor Migration	To municipal main cities	
Hazards	Floods Tropical storms Torrential rains Crop disease and pests Livestock disease and pests	

Seasonal calendar

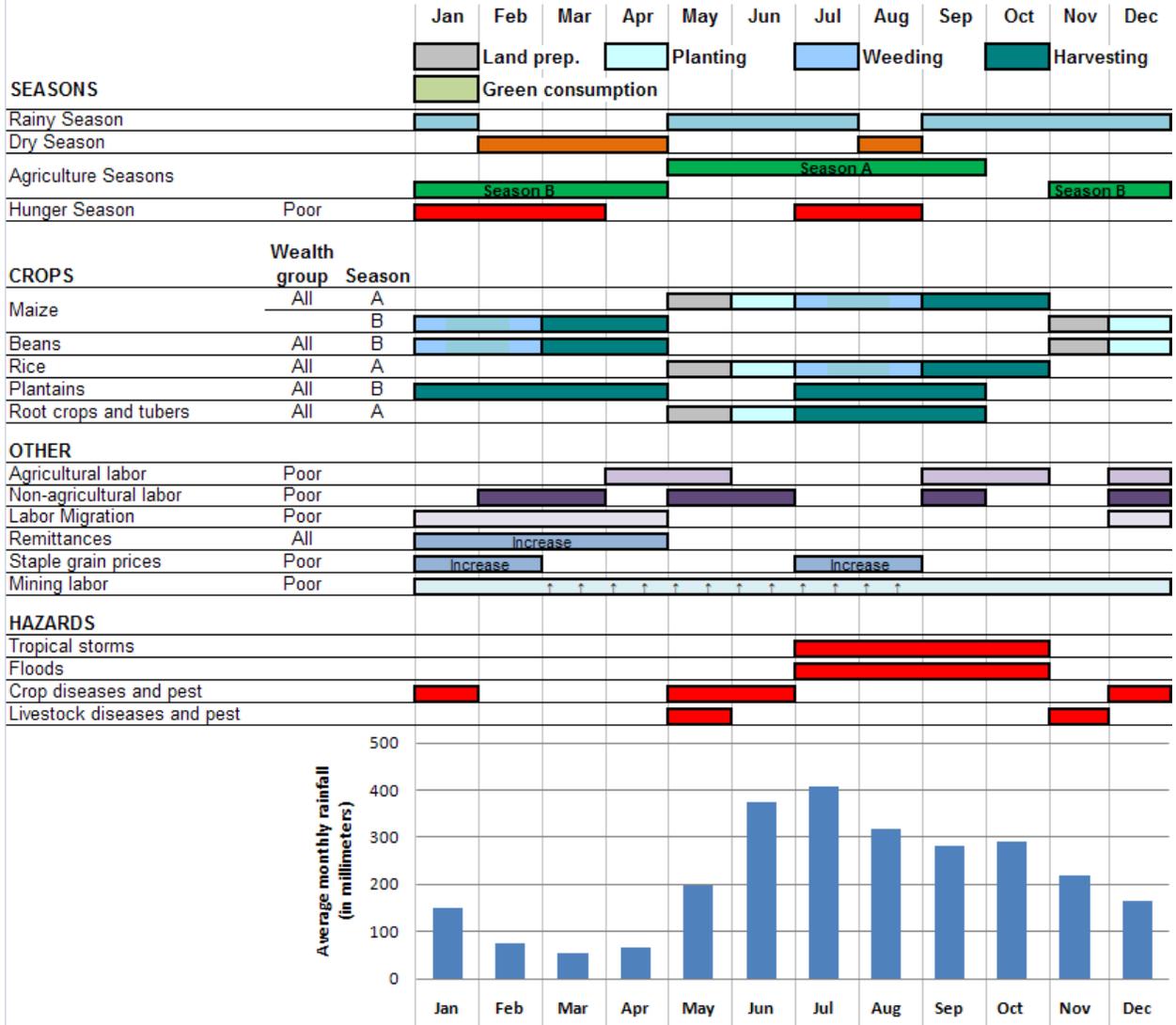
Zone 10: Caribbean Humid Tropical Agriculture



Livelihood Zone #11 – Northern Atlantic Agricultural Frontier and Mining Zone		
Food Crops	Beans Rice Tubers	<p>Located south of Las Bosawás forest reserve, this sparsely-populated zone contains a wealth of natural resources, including precious timbers, gold, fish and wild foods. The zone receives five to eight months of rainfall annually, starting in September/October. The climate is the wettest of the country with rains increasing from west to east, from 2,000 to 4,000 mm annually. An excess of water is a principle problem for agricultural activities, causing erosion and mineral impoverishment of the land with significant post-harvest losses of grains and sanitation problems for livestock. The majority of the zone's residents depend on subsistence agriculture, cattle ranching and mining, either directly or indirectly from the labor opportunities these activities provide.</p> <p>Crop production is the main source of food for most households, followed by food purchase and consumption of own livestock products. The majority of cultivated lands produce staple grains, maize, beans, non-irrigated rice, and some tubers (<i>malanga</i> and <i>quequisque</i>). The degree to which households rely on food purchase varies according to wealth, with the poor buying more food than their better-off neighbors. The contribution livestock products make to a poorer household's diet is minimal due to the fact that they own few.</p> <p>Labor is the main source of income for the zone's poor, but the activities they engage in range from working on the farms of the better-off, clearing land for cattle ranching and working in the mines. Better-off households earn most of their cash selling grain to traders and at the larger regional markets. They will also receive a significant portion of their income from cattle, as well as timber sales.</p> <p>The zone is quite isolated from the rest of Nicaragua as there is only one road that connects it with Managua. Market access is poor due to lack of adequate infrastructure, affordable transportation and the remoteness of many of the communities. Still, most communities have small markets offering essential food and non-food items. The marketing of grain is mostly reserved for those who can afford the high transportation cost to larger regional markets. However, traders from outside the zone, mostly from the mining triangle, will come to purchase locally-produced grains and livestock while importing commodities from neighboring zones.</p> <p>The main hazards of the zone mostly affect crop production. In an effort to compensate for crop losses, households expand current income-generating opportunities—or look for alternative opportunities—in order to purchase food. For the poor this includes the collection and consumption of wild foods, increased sale of timber and temporary migration outside the zone to look for work. Better-off households may also migrate out of the zone to look for laboring opportunities, sell more livestock and ask relatives to increase the quantity and frequency of remittances.</p>
Sold Crops	Rice Maize Roots and tubers	
Livestock	Cattle Pigs Poultry	
Cash Income	Daily labor in agriculture and mining Crop sales Livestock sales Timber sales Trade	
Main Markets	Siuna Rosita Bonanza Puerto Cabezas Mulukukú Río Blanco	
Labor Migration	To municipal main cities and Honduras	
Hazards	Floods Tropical storms Torrential rains Crop disease and pests Livestock disease and pests	

Seasonal calendar

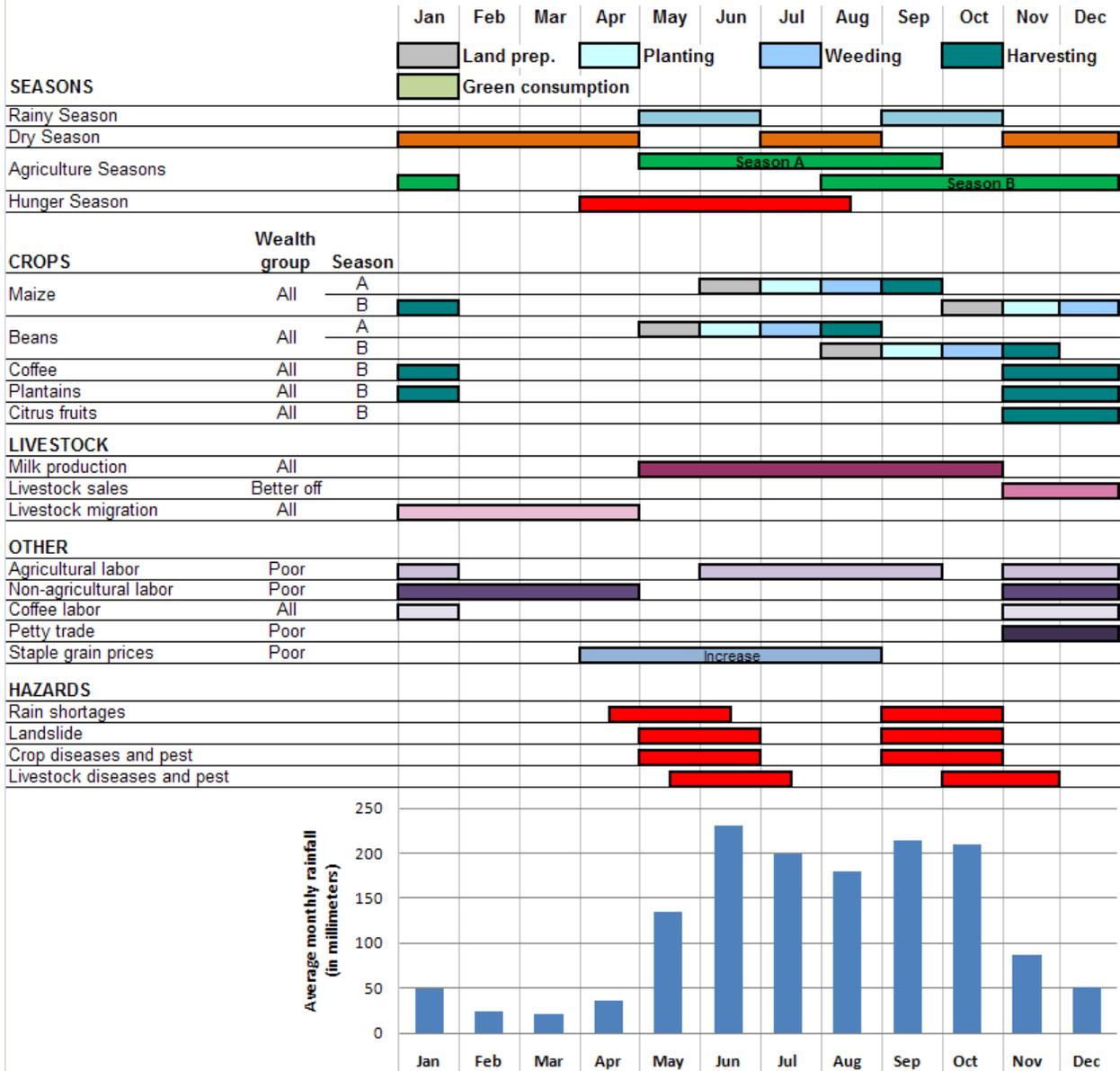
Zone 11: Northern Atlantic Agricultural Frontier and Mining



Livelihood Zone #12 – Coffee with Commercial Agriculture and Livestock Zone		
Food Crops	Maize Beans Plantains	<p>Households living in the coffee dominant areas of Nueva Segovia, Madriz, Jinotega and Maltagalpa departments share the same access to food and income, and therefore were grouped under one livelihood zone. This is a dry or semi-arid climate zone, with average annual rainfall of 1,500 mm. This zone is different from the very dry region because it has a larger peasant population and more intensive production systems for staple grains, vegetables and coffee.</p> <p>Livelihoods in this zone focus on coffee production, for which it is a net labor importer, and commercial mixed-farming. The poor also operate small parcels of land where they grow staple cereals for household consumption and/or for sale. They also are the main providers of unskilled manual labor, working on coffee plantations, mixed-farms and cattle ranches.</p> <p>All households depend on the market to purchase a portion of their food. For the poor, this portion is larger than for other wealth groups. Insufficient staple cereal reserves and increased prices make food acquisition difficult for the zone's poor. To cope with large food purchases, the poor participate in a range of income-generating activities, but for the most part they sell their unskilled, manual labor. Any hazards that decrease employment opportunities or wages of poor laborers directly affect the amount of food the poor can purchase and can result in acute food deficits.</p> <p>Since the labor pool is saturated by zone residents and laborers from other zones, many poor must migrate to neighboring countries to search for work. Better-off households earn cash by selling cash crops, livestock and livestock products and skilled labor.</p> <p>The Pan-American highway and regularly-maintained feeder roads ensure year-round access to the zone's major markets. The staple cereals sold at these markets come from either local producers or intermediaries from neighboring communities. Coffee, plantains and citrus are sold locally to intermediaries and are exported out of the zone.</p> <p>The dominant coping strategy for the zone's poor is to look for, and increase, the sale of labor. They may also solicit loans from better-off households in order to buy food and/or reduce the frequency and quantity of food consumed.</p> <p>Over the past few years, this zone has been negatively impacted by the "coffee crisis." However, because of its high level of diversity and proximity to the market, it has respectable advantages over other coffee zones to make up for lost revenues: the ability to sell fruits in markets in Masaya and Managua, and the sale of wood from trees previously grown to provide shade for the coffee plants. The problematic coffee sector has caused better-off households to engage in intensification in the use of chemical inputs and labor in coffee plantations. This reduction in the use of chemical inputs has favored the use of compost, which will allow, in the medium term, access to the organic coffee market.</p>
Sold Crops	Coffee Plantains Citrus Beans	
Livestock	Pigs Poultry	
Cash Income	Daily agricultural labor Crop sales Livestock sales	
Main Markets	Maltagalpa Jalapa Sebaco Jinotega	
Labor Migration	Within the zone, to El Salvador and Honduras	
Hazards	<p>Rain failure</p> <p>Landslides</p> <p>Crop disease and pests</p> <p>Livestock disease and pests</p>	

Seasonal calendar

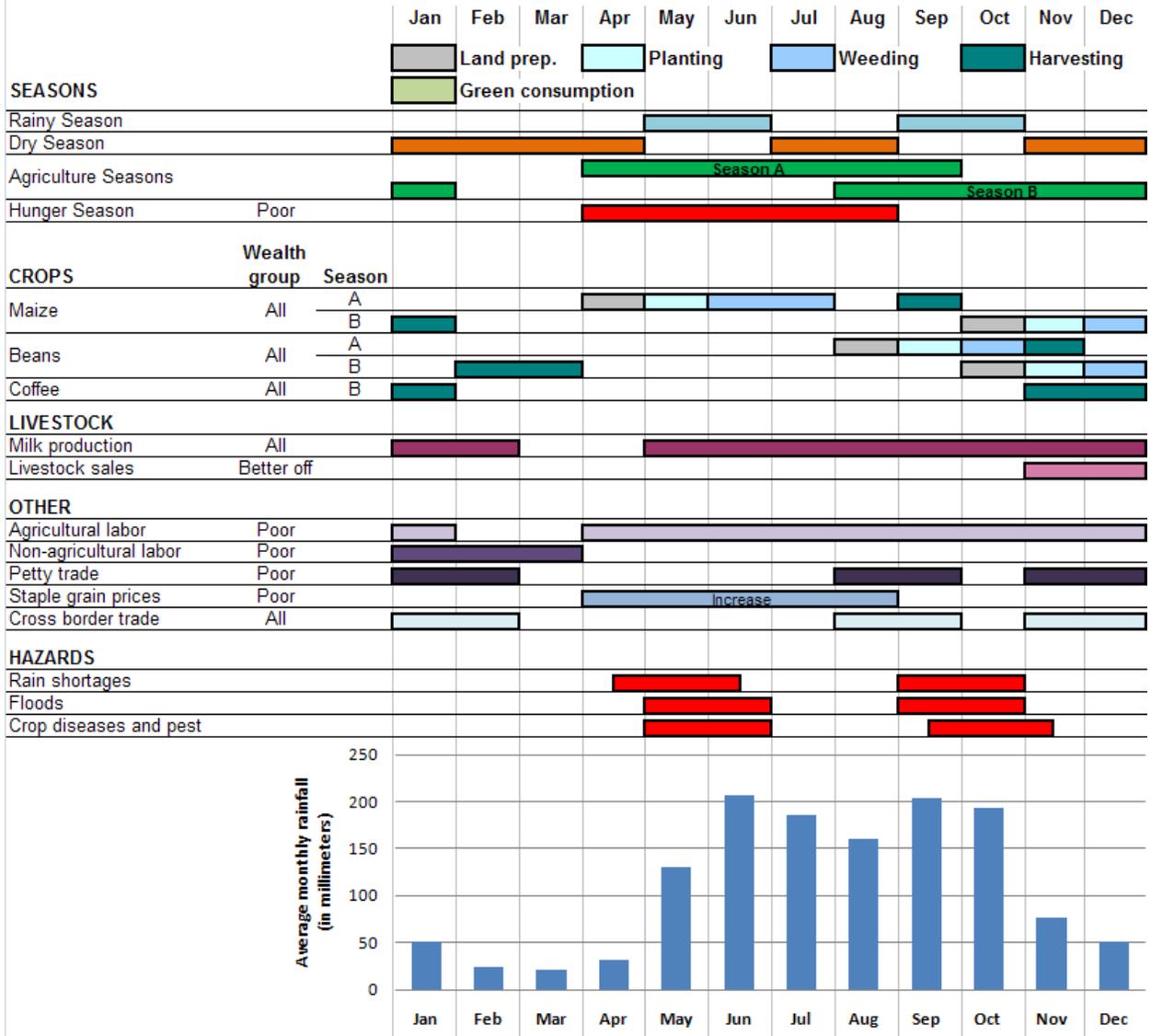
Zone 12: Coffee with Commercial Agriculture and Livestock



Livelihood Zone #13 – Northern Market-Bound Basic Grains, Livestock and Coffee Zone		
Food Crops	Maize Beans Rice	<p>This hilly and mountainous livelihood zone is characterized by the intensive production of rain-fed basic grains. Rainfall averages 1,400 mm per year. All households in the zone depend on grain production to meet the bulk of their food and cash needs. Livestock and livestock products are also important, as well as small-scale coffee production.</p> <p>Both ends of the wealth spectrum source most of their annual food needs from crop production; however, the quantities the poor are able to produce are significantly less than that of their better-off neighbors. Though households in this zone are capable of harvesting twice annually, limited access to land, animal traction, labor and agricultural inputs results in lower yields. Furthermore, the poor must sell a portion of their crops immediately after harvest to meet pressing cash needs. To cover remaining food gaps, the poor will purchase food from the market and earn grains as payment for working on better-off farms. Better-off will also supplement their annual food intake with purchased food and livestock products.</p> <p>Labor, followed by crop and livestock product sales, is the primary source of income for poor households. Most labor opportunities are found locally on better-off households' farms, but some laborers may also find labor opportunities in the nearby coffee zone, Honduras or Managua. Grains, and to a lesser extent coffee sales, dominate the better-offs' economic portfolio. Known for its high productivity of grains, this zone fills part of the grain demand for the country. Livestock and dairy product sales also provide significant earnings for the better-off.</p> <p>Similar to other zones in this region, market access is generally good. The Pan-American highway and well-maintained feeder roads connect the zone to larger regional markets and allow a steady exchange of commodities. Grains and, to a lesser degree, vegetables and root crops are sold at local markets or to intermediaries, who then transport them to larger department markets and/or Managua. Coffee producers sell to international coffee traders at the department level, who then export and sell on the international market.</p> <p>When faced with food or cash deficits, households will sell small stock in order to compensate from losses. They will also collect and sell firewood, engage in petty trade or cultivate fast-growing vegetable crops to sell upon harvest. Better-off households reduce their labor hiring, and can even reduce their areas for crops.</p>
Sold Crops	Maize Beans Vegetables Roots and tubers Coffee	
Livestock	Cattle Pigs Poultry	
Cash Income	Daily labor Crop sales Livestock sales Livestock product sales	
Main Markets	<u>Cereals</u> Jalapa Quilali Wiwili Pantasma Jinotega <u>Cattle</u> Mataderos de Condega Managua Nandaime	
Labor Migration	Within the zone, to the coffee zone or to El Salvador and Honduras	
Hazards	Floods Rain failure Crop disease and pests Landslides Livestock disease and pests	

Seasonal calendar

Zone 13: Northern Market-bound Basic Grains, Livestock and Coffee

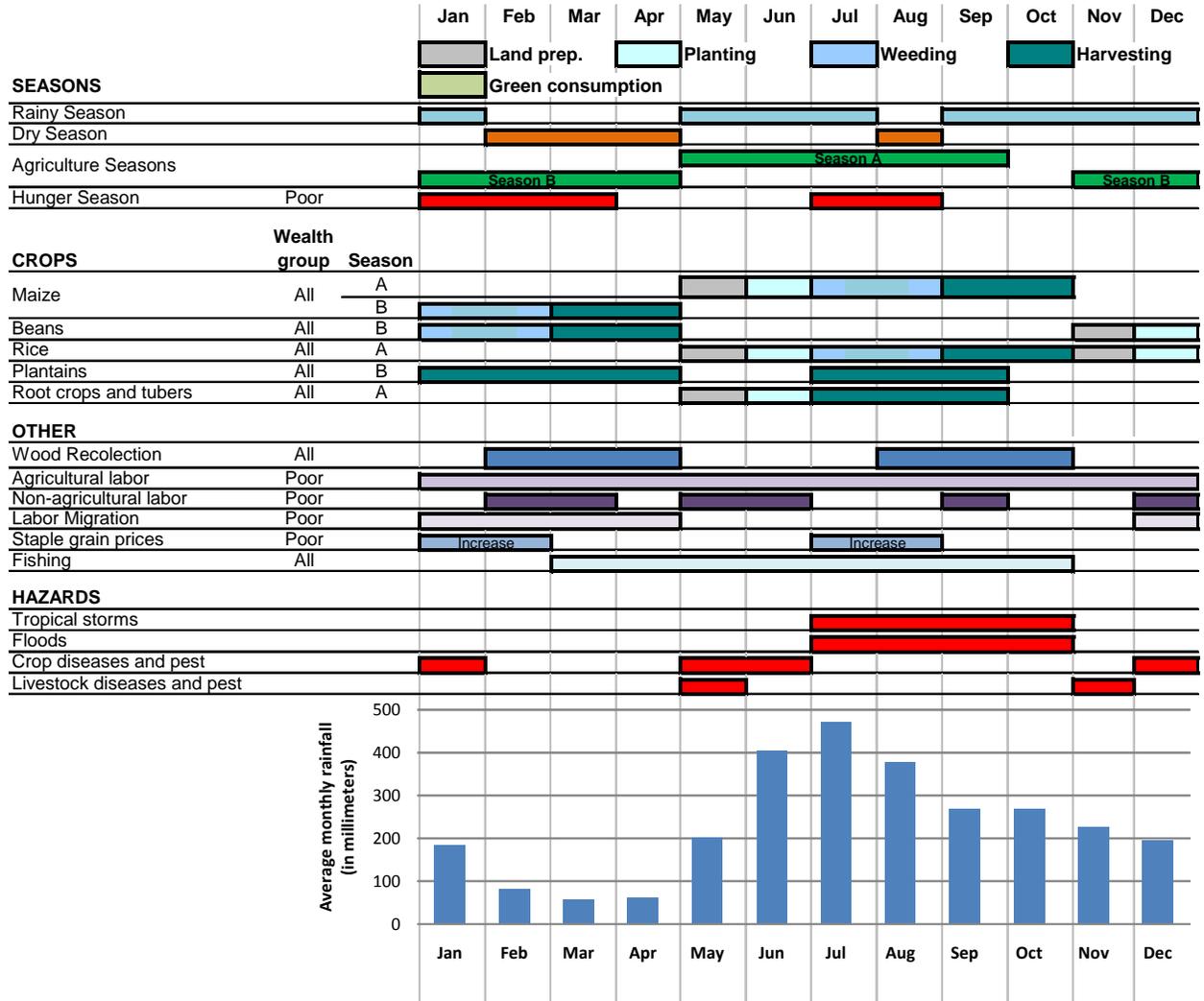


Livelihood Zone #14 – Communal Forestry Zone		
Food Crops	Maize Beans Rice Tubers	<p>This is a zone characterized by forest-related livelihoods combined with basic grain and tuber production for household consumption. Rainfall averages 2,800 mm per year.</p> <p>In this area, households have an average of 35 to 140 hectares of land³, with 2 to 5 heads of livestock and extensive systems of basic grain and tuber production, and pig and livestock raising.</p> <p>Non-agricultural activity is casual/temporary and not highly developed. Wood selling is the most important of these activities. Market integration is limited due to a poor road infrastructure; pigs, beans and rice are sold locally or with intermediaries.</p> <p>There is very little wage labor, and households generate cash income through day labor or immigration to coffee-producing areas. They are only self-sufficient in basic grains and tubers, and in some cases <i>cuajada</i> (a regional dairy product). All other goods are bought in the market.</p> <p>The principle problems affecting this zone are social and environmental in nature. Indiscriminate (and at times illegal) deforestation, and soil degradation and loss of animal and plant biodiversity, due to burning fields to prepare livestock pasture, are serious problems in this zone</p>
Sold Crops	Rice Beans Roots and tubers	
Livestock	Cattle Pigs Poultry	
Cash Income	Sale of timber and firewood Day labor Small livestock sale Crop sale	
Main Markets	<u>Crop and livestock production</u> Local markets <u>Wood</u> Rosita, Siuna, Bonanza and Managua	
Labor migration	To municipal main cities	
Hazards	Indiscriminate deforestation Forest fires Floods Environmental degradation Livestock disease and pests Crop disease and pests	

³ From 50 to 200 *manzanas*.

Seasonal calendar

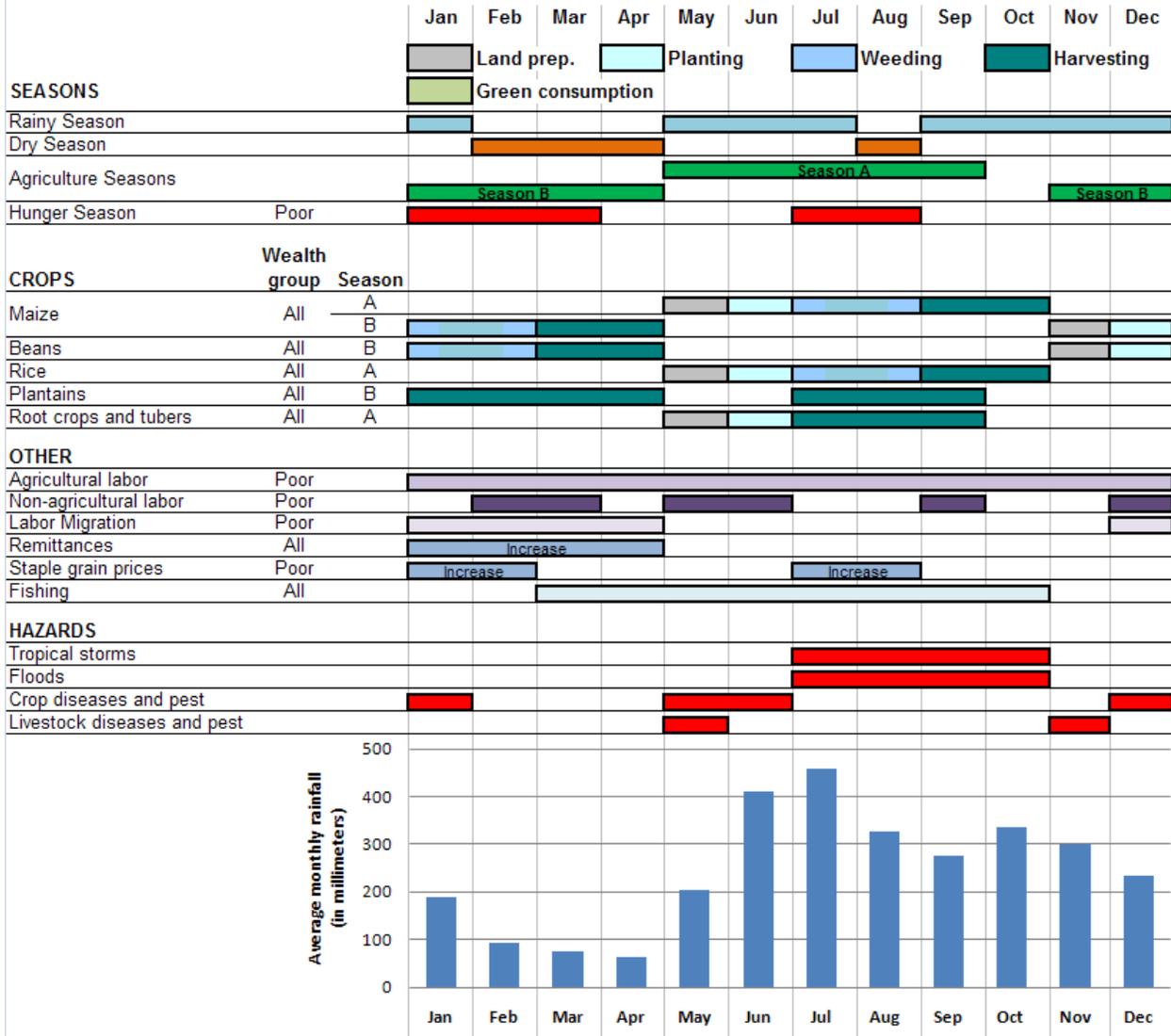
Zone 14: Communal Forestry Zone



Livelihood Zone #15– Coco River Traditional Agriculture Zone		
Food Crops	Maize Beans Rice	<p>This thin, flat zone skirts the northern fringes of RAAN department, along the banks of the Coco River. Well-drained alluvial soils and 3,000 mm of annual precipitation offer optimal conditions for the extensive production of staple food such as maize, beans and rice, as well as plantains and yucca. The Coco river serves as the zone’s commercial artery, connecting communities that reside along its banks.</p> <p>Crop production is the most significant source of food for most households in the zone, followed by purchase and the consumption of own livestock products. Poor households are unable to sustain themselves throughout the year and therefore must buy staples. Better-off households produce more and are able to consume their own crops for more months, but will also purchase food. Both households will consume milk and other livestock products, but the extent to which they do so depends on livestock ownership.</p> <p>Farm labor opportunities are the primary source of revenue for the zone’s poor, followed by the sale of surplus crops and the occasional sale of timber. The income-generating portfolio of better-off households is more diverse than that of their poor neighbors. The better-off sell beans, cattle and trading gold, and general non-food essentials.</p> <p>The Coco River serves as the only link between communities and scarce transportation renders the movement of commodities very expensive. Waspam is the closest major market in the zone, but its location on the western fringes of the zone makes market access difficult for those residing in the east. Beans and, to a lesser extent, rice and root crops are transported by intermediaries from the Pacific coast and Managua to the markets of Waspam, Puerto Cabezas and communities in Honduras. Livestock are mostly traded within the zone via the Coco River and sometimes to the main market of Waspam.</p> <p>The main coping strategies households employ are an extension of normal activities. The collection and consumption of wild foods, increased hunting and fishing, labor migration to coast zones or to Puerto Cabezas and Waspan, and petty trade are existing income-earning strategies that are augmented during times of food or economic stress.</p>
Sold Crops	Beans Plantains Yucca	
Livestock	Local cattle Pigs Poultry	
Cash Income	Daily labor Crop sales Gold panning Livestock sales Trade Timber sales	
Main Markets	Waspam River communities Honduran communities	
LaborMigration	To Honduras	
Hazards	<p>Floods</p> <p>Tropical storms</p> <p>Limited market access</p> <p>Crop disease and pests</p> <p>Livestock diseases and pests</p>	

Seasonal calendar

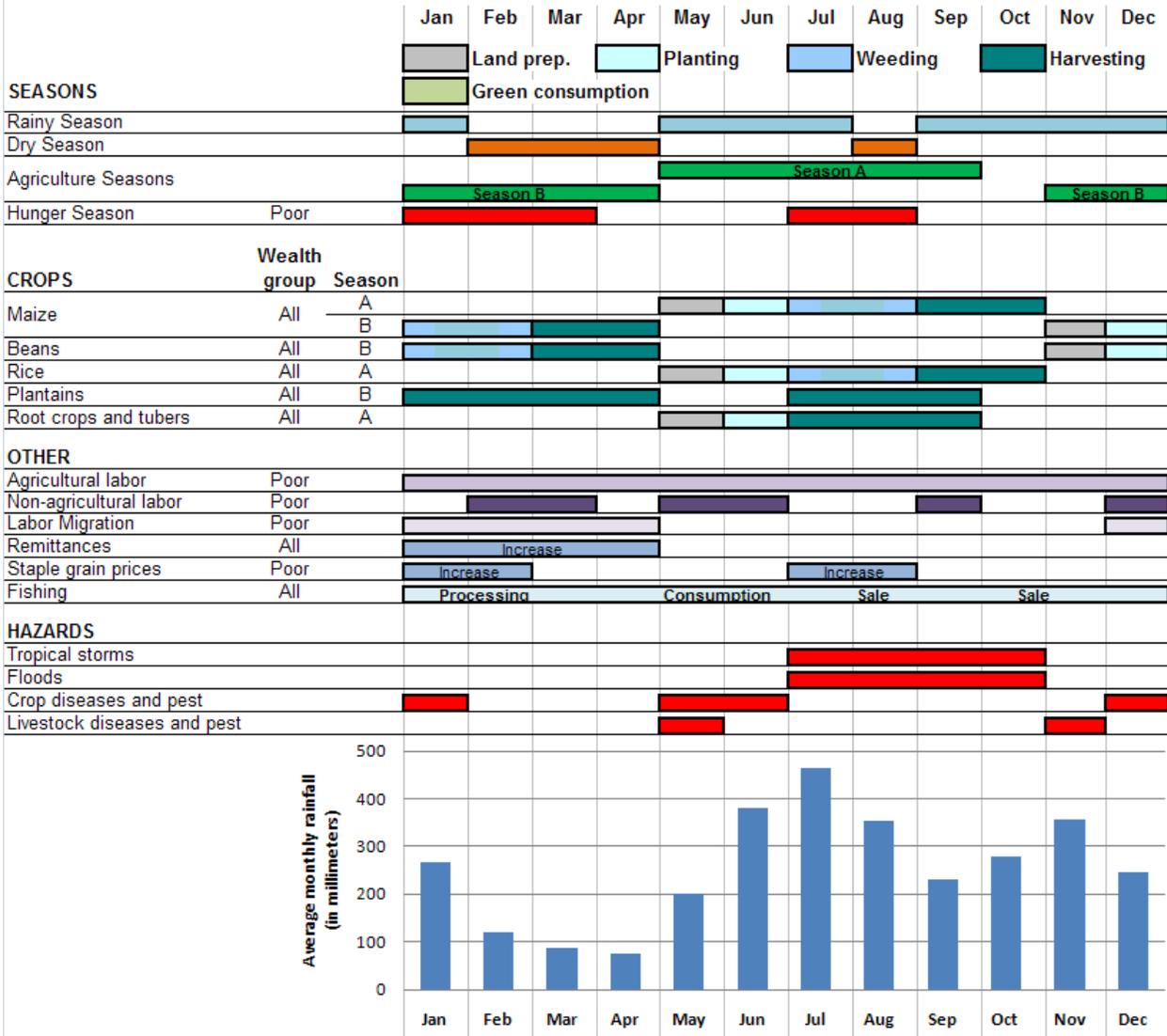
Zone 15: Coco River Traditional Agriculture



Livelihood Zone #16 – Caribbean Coast Traditional Fishing Zone		
Food Crops	Beans Rice Plantains	<p>This long, fishing-based coastal zone is characterized by vast palm-lined beaches, mangroves, estuaries and coastal lagoons. The borders of this zone extend from the shore inland about five to fifteen km, and reaches from the Honduran border south to Costa Rica. Annual precipitation averages 3,100 mm and falls mostly from May to January. Most of the zone’s residents rely on artisanal fishing practices; however, there are pockets of industrialized fishing enterprises in Puerto Cabezas, Bluefields, El Bluff, Cayos Perlas and Miskitos and the Corn Islands. Households living in the north, towards the Honduran border, will also engage in free-diving, collecting lobsters and other shell fish. Though fishing is important, households will also engage in subsistence farming, growing beans, rice and plantains. Livestock ownership is limited to pigs and poultry and, like the crops produced, livestock is reserved for household consumption.</p> <p>Nearly all households rely on farming to meet the bulk of their annual food needs. They will supplement production with shellfish, fish and livestock products, followed by food purchases.</p> <p>Fishing serves as the main source of revenue for all households. Better-off will pay laborers cash to work on their boats and sell their catch locally, to intermediaries or to the larger fishing enterprises for processing. The better-off may also engage in small commerce, selling food and non-food items in small shops. In addition to the cash earned from laboring on fish boats and farms, the poor may sell a portion of their crops immediately after the harvest to meet immediate or pressing cash needs.</p> <p>Underdeveloped infrastructure and poor transportation options limit market access for most households. Prices of staple foods are dictated by demand and by the intermediaries who operate in the zone. Grains are sold to intermediaries and are exported to larger trading areas within and outside the zone. Though uncommon, pigs and poultry sales are sold in the same manner as grains. Fish and other seafood are sold to fish processing plants within the zone, to local traders and to traders from Managua who transport them to larger cities or for export abroad. Scarce labor opportunities in the zone force many laborers to find employment outside the zone. Many will work on cruise liners or migrate to the United States or the Grand Cayman Islands. The zone’s sparse population, limited government presence and geographic remoteness attract drug trafficking.</p> <p>As in neighboring zones, strategies employed by households to recover from hazard-induced cash or food deficits are limited. Households will migrate out of the zone to look for work, consume wild roots, fruits and animals, solicit remittances from family members and engage in self-employment activities (legal and illegal).</p>
Sold Crops	N/A	
Livestock	Pigs Poultry	
Cash Income	Daily labor Fish sales Crop sales Livestock sales Trade Remittances	
Main Markets	Puerto Cabezas Bluefields Waspmam	
Labor Migration	They go on board ships or to USA	
Hazards	Floods Tropical storms Livestock disease and pests Crop disease and pests	

Seasonal calendar

Zone 16: Caribbean Coast Traditional Fishing



Annex – Workshop participants

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